

THE MAGAZINE OF COMPLIANCE AND Metal Products Manufacturing

FROM RAW METAL TO FINISHED PRODUCT

TP 785



Whether you smelt your own frit or buy from a frit manufacturer, "Ceramic", specializing in color manufacture, has the right color oxide or stain for that frit.

Modern plant facilities, rigid laboratory control and a progressive research program, all under the personal supervision of actively interested executives with years of ceramic experience in general and ceramic colors in particular, give you this assurance.

Why not consult a color specialist?
Write us.

# "Ceramic Colors CERAMIC COLOR & CHEMICAL MFG. CO. NEW BRIGHTON, PA., U.S.A.

149

# Porcelain enamel is ideal for

# MODERN DESIGNS

This is one of the big advantages of Porcelain Enamel on Armco Enameling Iron:

You can adapt this modern finish to practically any design for the products you make. It may not even be necessary to change your present designs to assure uniformly good results—in your shop as well as when your products are in service.

Four important factors should be kept in mind when designing parts or products for porcelain enameling: (1) correct radii of curvature on all parts; (2) sufficient internal support at all points; (3) metal of sufficient thickness to resist warping or twisting during firing; and (4) the metal should be made specifically for porcelain enameling.

# OFFERS SALES AIDS

Besides its adaptability to modern design, Porcelain Enamel stands out as a sales-aid in comparison with other finishes.

It is a "lifetime finish" that is not affected by time or corrosion. It resists acids, and is not harmed by hot skillets, forgotten cigarettes, or even hot electric irons. What's more, stains and dirt come off easily when the surface is washed with soap and water.

Porcelain Enameled products can be supplied in any color and in any variation of shades. Colors never "fade out" or lose their original luster.

# UNIFORM QUALITIES

Of course, the metal beneath the Porcelain Enameled surface must have excellent bonding qualities, flatness, and uniform fabricating characteristics. That is why more manufacturers have used more Armco Enameling Iron over a longer period than any other enameling base. That is why too it has become known as the "World's Standard Enameling Iron."



The radii of curvature of metal parts to be porcelain enameled should always exceed 3/16".

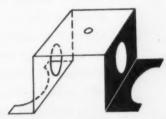


Lack of support at Point X could result in flexing and chipping.

Maintaining part of flange (sketch at right) corrects this.



Flanging of edges near large holes gives needed support, which prevents deforming of metal during firing.



Support lugs or clips should be of lighter gage and cut away at junction points, to reduce area of doublethick metal to be heated when coatings are fired.

# ARMCO STEEL CORPORATION

3712 CURTIS STREET, MIDDLETOWN, ONIO ● PLANTS AND SALES OFFICES FROM COAST TO COAST ● EXPORT: THE ARMCO INTERNATIONAL CORPORATION





ALUMINUM & MAGNESIUM CASTINGS







Deep fat fryer casting including rod-type heating elements cast in as a complete unit. Acme has produced hundreds of thousands of these units.

Acme of Chicago offers a complete engineering service with over 33 years of engineering and foundry experience back of this service.

Better light metal engineering service may mean the difference between success and failure in using light metal castings.

Acme of Chicago also offers a complete casting service including aluminum alloy permanent mold and semi-permanent mold castings and aluminum and magnesium alloy sand castings. We are interested in special castings too, including castings with steel inserts and castings with heating elements or tubing cast in as a complete unit. We also offer aluminum and magnesium heat treated and aged castings to meet military specifications.

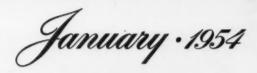
When you need engineering and casting service for better light metal castings call Acme of Chicago.



# ALUMINUM FOUNDRY CO.

6837 SOUTH BELL AVENUE . CHICAGO 36, ILLINOIS

JANUARY . 1954 finish



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VOL. 11 . NO. 1

FROM RAW MATERIAL TO FINISHED PRODUCT — Part I

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KITCHEN CABINET INDUSTRY PLANS

### MONTHLY TRADE PUBLICATION

Established January 1944 Published by

### DANA CHASE PUBLICATIONS

360 North Michigan Avenue Chicago 1 Telephone CEntral 6-1229

A trade publication devoted to the interests of the metal products manufacturing industry with special citorial attention to home appliances. Includes technical and practical information on plant facilities

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technical and practical information on plant facilities and manufacturing problems from raw metal to safe delivery of the finished product, with special emphasis on fabrication, metal preparation, metal finishing, assembly, and packaging and shipping.

Free controlled circulation to management, purchasing, engineering and key plant personnel in metal product manufacturing plants. To others, subscription price is \$5.00 per year, domestic. To all other countries \$8.00 per year (U.S. funds).

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CCA NBP

PRODUCTS MANUFACTUR METAL TO FINISHED PRO

# A Lancaster 'clip-on' indicator produces the magic touch for **Magic Chef**



Magic Chef's exclusive "magic oven-eye", advertised in LIFE and other national magazines, makes sales . . . but it presented problems in production!
What "eye" could take the

heat? Would not discolor, warp, rot or rust? How could it be installed economically?

Lancaster Lens came up with the magic answer - one simple glass part.

Though tiny, it could be produced to exact specifications. specially molded to give permanent depth and brilliance to letters

The design of this one glass part did away with the need for nuts, bolts and washers in the "magic oven-eye" assembly.

So - Magic Chef got the perfect "magic oven-eye"! A glass part which costs less to produce and less to install.

That's why Magic Chef chose Lancaster glass!

Lancaster glass parts can do a job for your product - cut costs

and give added sales appeal. Find out more about the economy and sales power of Lancaster glass, today! Write The Lancaster Lens Company, Lancaster, Ohio. Lancaster engineers are available for consultation.

# MEETINGS

# HOME FURNISHINGS MARKET

International Home Furnishings and Winter Home Furnishings Markets, The Merchandise Mart, and The American Furniture Market, Chicago, January 4-15.

# HOME LAUNDRY MFRS.

American Home Laundry Manufacturers Association, annual meeting, Morrison Hotel, Chicago, January 8.

# HOUSEWARES MFRS. EXHIBIT

National Housewares Manufacturers Association, 20th national housewares and home appliance exhibit, Navy Pier, Chicago, January 14-21.

# PLANT MAINTENANCE SHOW

Plant Maintenance and Engineering Show, International Amphitheatre, Chicago, January 25-28.

# **ENAMELERS CLUB MEETINGS**

Midwest Enamelers Club, LaSalle Hotel, Chicago, January 23.

Central District Enamelers Club, Mansfield Leland Hotel, Mansfield, Ohio, February 5.

Eastern Enamelers Club, Hotel Sylvania, Philadelphia, February 27.

# ELECTRIC SIGN ASSN.

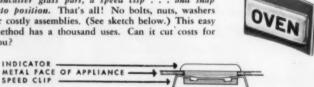
National Electric Sign Association, annual meeting, Conrad Hilton Hotel, Chicago, February 28 to March 3.

# PRESSED METAL INSTITUTE SPRING TECHNICAL MEETING

Pressed Metal Institute, annual spring technical meeting, Hotel Carter, Cleveland, March 17-19.

JANUARY . 1954 finish

Here's the secret of Lancaster's easy, cost-cutting installation used on the "magic oven-eye". One Lancaster glass part, a speed clip . . . and snap into position. That's all! No bolts, nuts, washers or costly assemblies. (See sketch below.) This easy method has a thousand uses. Can it cut costs for



THE Lancaster Lens co.





Workmen charge a pebble mill at the A. O. Smith Corporation—where milling time was reduced 46%—from 5,800 revolutions to 3,100 by using Coors Alumina Ceramic Grinding Balls.

The use of Coors High Density Grinding Balls, according to actual experience in enameling plants, will produce these results:

1. Permit you to obtain greater output per mill.

2. Reduce cost of balls because of much lower ball loss due to wear.

3. Increase the life of your porcelain mill linings when mills are properly

# A. O. SMITH CORP. EXPERIENCE SHOWS:

"We find that to produce the proper fineness, 3,100 revolutions per batch are required with your Alumina Balls [in a 5'x6' mill]. With the previously used balls, 5,800 revolutions were required for the same fineness, or nearly twice the time requirement.

"This improvement in grinding cycle time means that we can almost double our productive capacity without adding additional mills. Besides the cost and difficulty of obtaining new mills, the floor space saving effected for increasing the capacity is often important...

"...31 batches of glass-lined slip have been ground in this mill with no additional [Coors Alumina] balls being added for wear. Our previous records reveal that with conventional balls, we were having to add 12 pounds of balls per charge for ball loss during each cycle of grinding."

You can get similar savings in your own mills. Write your Coors representative, today!

Available from stock in sizes 1", 1¼", 1½", 1¾", 2" and 2½" and in the new Natural Shape Media.

# By Test the Best!

- High Density Faster Grind
- Long Life Uniform Wear
- No Chipping or Cracking
- Pure White No Color Contamination
- Smooth Surfaces Easy Cleaning



CORS PORCELAIN COMPANY

lational sales representatives ... LEP Industrial Coramics,

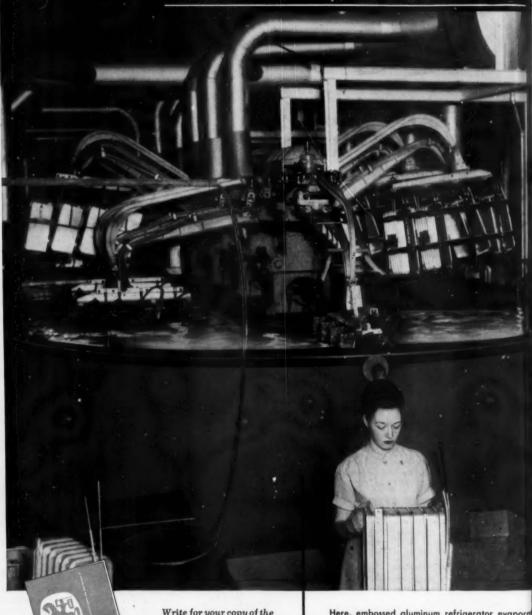
Sete Agent for the knameling industry... East of the Rocky Mountal Chicaga Vitroous Enamel Product Co., 1427 South 55th Court, Clearo 50, Illinois.

California sales representative ... Malvin L. Jentz Company

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# For Greater Design Flexibilit e



Write for your copy of the new 24-page "Catalog of Facilities." Get full details on the tremendous production facilities of Reynolds Aluminum Fabricating Service.

Here, embossed aluminum refrigerator evapore anodized on Reynolds modern equipment to assumum strength, corrosion resistance, rapid heat tion, long lasting attractive appearance and examples of finishing operations at Reynolds a formed on automatic equipment to provide constraints.

# REYNOLDS ALUMINU

BLANKING · EMBOSSING · STAMPING · DRAWING · RIVETING · FORM

# QUALITY FINISHES ON ALUMINUM PARTS RODUCED TO YOUR SPECIFICATIONS

Mechanical · Chemical · Electrolytic · Organic

holds Aluminum Fabricating Service offers llent facilities for plain anodizing, color lizing, alodizing, buffing, washing, degreaspainting, oven-drying, infra-red baking other finishing operations. Reynolds also s you the advantages of years of experiwith many finishing processes and matethat increase the natural corrosion resist, increase abrasion resistance and augment natural attractiveness of aluminum.

hether your parts require mechanical, nical, electrolytic, organic or other specialfinishes, the design and engineering assistoffered by Reynolds Aluminum Fabricat-Service assures fast, economical, efficient ce on your finishing needs. Reynolds exence and facilities also offer you the oppory for greater variety of flexibility in your n ideas-along with the assurance of turnhese ideas into high quality finished parts. member-Reynolds design and engineerservice, experience, facilities and quality rol from mine to finished product are imint advantages that you can count on in operations, too. For full details, call your evapora nolds office listed under "Aluminum" in classified telephone directory or write holds Aluminum Fabricating Service, 2058 and eath Ninth Street, Louisville 1, Kentucky.



Photograph shows step in buffing operation of aluminum deep well cookers produced by Reynolds Aluminum Fabricating Service for a range manufacturer.



Alodize system in a Reynolds plant used for alodizing continuous coils of aluminum which are later shipped as coils or cut and shipped as flat sheet.



Anodized aluminum washer and dryer tubs like these are produced to manufacturers' specifications by Reynolds Aluminum Fabricating Service.

See "Mister Peepers" Sundays on NBC-TV. Consult local listing for time and station.

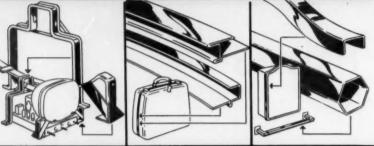
# BRICATING SERVICE

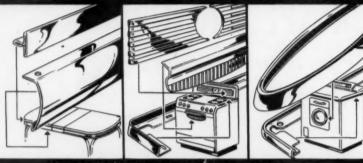


SHAPING . THRE RENDING . WEIDING . RRAZING . FINISHING

finish JANUARY . 1954

# PYRAMID MOULDINGS





IALISTS IN STAINLESS STEEL



Rings for washers... Bezels for television... Dinette trim and aprons... Refrigerator kick plates and escutcheons... Stove back guard trim-Flue grills... Kitchen Counter Mouldings...Sink Rims...Medicine cabinet frames-Towel Bars...Wallboard Mouldings...Frames for luggage. These are but a few of the many products for which PYRAMID has facilities to design, roll, bend, stamp, buff and assemble both decorative and structural mouldings in any metal. Fast service from complete plants in Chicago and California.

# Pyramid Mouldings Inc.

5365 WEST ARMSTRONG AVE., CHICAGO 30, ILL. NEW YORK ... CALIFORNIA

# Write for Pyramid "Plan Book of Metal Mouldings" today!

No one connected with the design or manufacture of any appliance should be without a copy of this book containing hundreds of standard and special mouldings. Send for your free copy today.

"Plan	Book	of	Metal	Mouldings."
Name.				Title
Firm_				



# has enjoyed finish for long time but wants own personal copy

Gentlemen:

Will you please place my name on your circulation list? I have been reading and enjoying finish for a long time, but have never received my own personal copy.

John J. Geraghty Supt.-Mfg. Division The Chicago Hardware Foundry Co. North Chicago, Illinois

### wants regular receipt of magazine

Gentlemen:

We will appreciate the regular receipt of your monthly trade publica-tion, finish. We purchase materials from some of your advertisers: American Chemical Paint Co., Armco Steel Corp., Republic Steel Corp., etc., and use Spra-Con equipment.

Bruce I. Whiting Engineering Department Martin Steel Products Corp. Mansfield, Ohio

# finest publication in its field

Gentlemen:

A folder containing copies of some of our publicity and educational releases is being mailed to you under separate cover. Enclosed also are several additional copies of "Color Variants" and "Facts of Architectural Porcelain Enamel."

Finish is without doubt the finest publication in its field, and we would be very pleased to receive mention in its editorial section.

> J. A. Rumer Executive Secretary Porcelain Enamel Publicity Bureau Pasadena, California

# CORRECTION

# Athens Stove still in Tennessee

Our red-faced production department has been reminded that Athens Stove Works, Inc. is in Athens, Tennessee, and not in Athens, Georgia, as incorrectly noted on Page 30 of December finish.

Our apologies to both Mr. F. O. Mahery, Jr., and his company for temporarily moving their plant to another site - Eds.

(Note: the form including Page 30 was off the presses when this error was noted.)



# PHOSPHATE COATINGS TO MAKE YOUR PRODUCT DURABLE\*

# PIONEERING RESEARCH AND DEVELOPMENT SINCE 1914

For more than a third of a century, ACP research chemists and ACP technical representatives in the field have pioneered in the science of metal preservation. They have developed surface treating chemicals which either protect metals directly, or create a superior bond for decorative and protective paint finishes, and now, ACP chemicals and processes are being used the world around to reduce costs, speed production and add to the life-span of countless products.

ACP metal protective chemicals include: protective coating chemicals for steel, zinc and aluminum; metal cleaners and rust removers; final rinse controls; pickling acid inhibitors; copper coating chemicals; soldering fluxes; alkali cleaners and addition agents; copper stripping and brightening solutions.

# PAINT BONDING

"GRANODINE"® zinc phosphate coatings improve paint adhesion on automobiles, refrigerators, projectiles, rockets, and many other steel and iron fabricated units or components.

"LITHOFORM" zinc phosphate coatings, make paint stick to galvanized iron and other zinc and cadmium surfaces.

"ALODINE"® protective coatings provide improved paint adhesion and high corrosion-resistance for aircraft and aircraft parts, awnings, wall tile, signs, bazookas, and many other products made of aluminum.

# RUST PROOFING

"PERMADINE"® zinc phosphate coatings provide rust and corrosion proofing for nuts, bolts, screws, hardware, tools, guns, cartridge clips, and many other industrial and ordnance items.

### PROTECTION FOR FRICTION SURFACES

"THERMOIL GRANODINE" manganese-iron phosphate coatings provide both rust proofing and wear resistance — anti-galling, safe break-in, friction on rubbing parts.

# IMPROVED DRAWING AND COLD FORMING

"GRANODRAW"® zinc phosphate coatings make possible improved drawing, cold forming and extrusion on such steel products as sheets for stamping, bumpers, parts to be formed, prior to plating or painting, cartridge cases, etc.

\*Made, Sold, and Serviced By A Pioneer In Protective Coatings For Metals . . .

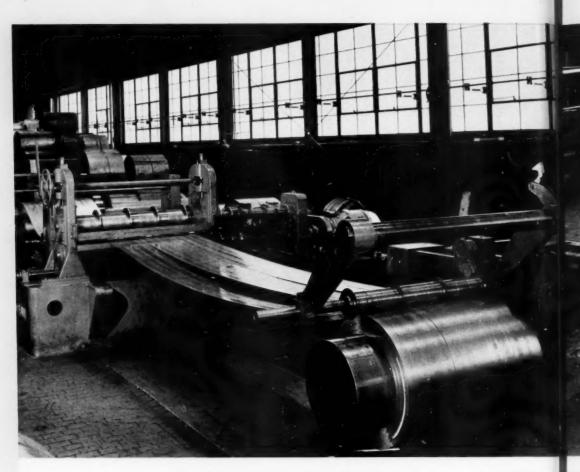
# AMERICAN CHEMICAL PAINT COMPANY

General Offices: Ambler, Penna.

Detroit, Michigan

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Windsor, Ontario



# HERE'S HOW The WEAK Can Save You 20%

And

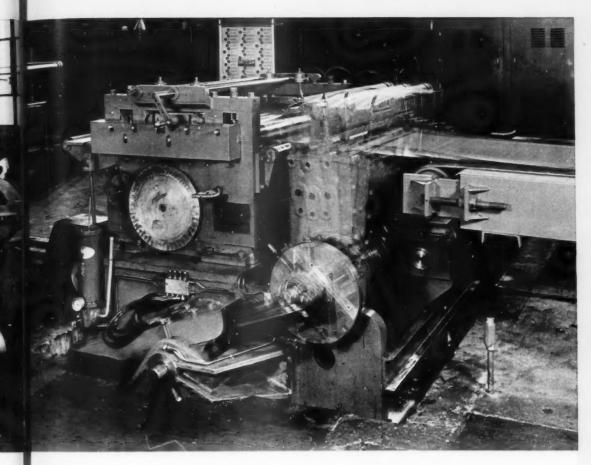
# Here's A Simple Test That May Startle You

Want to save 20 percent on your steel costs? If you are using sheet steel in any great amounts a Wean Equipment engineer can quickly show you how the amazing new Wean Slitting and Flying Shear Line can effect this savings in your plant. Using your actual figures, Wean can, by a simple comparison method, quickly prove to you that these savings are possible. Why continue operating at high costs when this improved method could be saving you as much as \$20 a ton on your steel?

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# AlSlitting and Flying Shear Line On Your Steel Costs

The secret of these tremendous savings is a short cut in getting steel from coil form to fabrication. If you are not one of those already using the Wean Slitting and Flying Shear Line you are either paying high mill extras for shearing to tolerance and size or are forced to do this operation expensively and slowly in your own plant or a costly combination of both.

The Wean Slitting and Flying Shear System eliminates this entire processing function by converting steel from coil to production size, at resquared tolerances, at a rate of 100 cuts per minute.

Just figure it out for yourself. Apply these figures to your own operation. Total up the extras you are now paying for steel preparation and you'll see why it will pay you to talk with Wean.



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SYSTEMS

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We're mighty proud of our brand new "baby" . . . and we'd like to tell all of you—present customers and future customers—about it. Our fine, new plant covers most of a city block and gives us 150% greater production capacity. Now we'll be able to keep up with the increasing demand for Macco Special Drawing and Cutting Oils, Macco Phosphatizing Solutions for cleaning and rust-preventing, and other Specialized Macco Compounds used in metal processing.

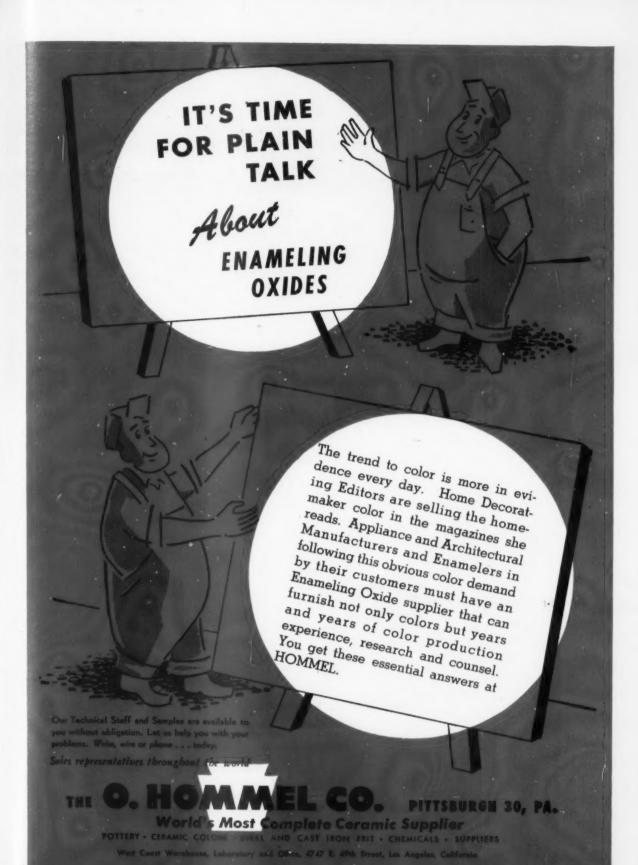
The plant layout has been scientifically planned to make our operation just as efficient and economical as possible. In-process materials proceed through the plant at a steady, uniform rate—from Receiving, through the various stages of Production, to Shipping. Quality-control stations maintain constant surveillance at each step, assurance to you that all Macco Compounds will continue to be completely dependable.

Another feature of which we are very proud is the fireproof, explosion-proof compounding room, the safest and most modern in the industry.

You're cordially invited to drop in. We'll be happy to show you through our beautiful, new plant and we know you'll find it most interesting. It's truly a "show window" of industrial efficiency, safety and up-to-date, quality control.



9210 SOUTH SANGAMON STREET . CHICAGO 20, ILLINOIS



# Ahead of Schedule! Four million tons :a

Now completed, right in the heart of the automotive industry, are facilities that increase Great Lakes Steel's annual capacity to four million ingot tons. That's about 25% of this industry's annual appetite for steel, and about 40% of its appetite for the kinds of steel we make.

So this growth of Great Lakes Steel—weeks ahead of schedule—means a great deal not only to us but to our principal customer, and others, too.

Our new facilities—new blast furnaces, the new bessemer converters, the new slabbing mill, and the rest—all fit into a program established long ago, when the company was founded. The program called for Great Lakes Steel to provide manufacturers with a dependable first source of sheet, strip and other shapes. And that's just what we've been doing.

We start with the ore, and work it through blast furnaces, bessemers and open hearths, blooming mills, hot and cold rolling mills and merchant mills, right down to the finished forms. This integration of control gives Great Lakes Steel the flexibility and availability that let us give real service.

Not just another steel supplier, Great Lakes is also a *developer* of steels now important to the industry—N-A-X HIGH-TENSILE steels, which combine extra strength, formability, and corrosion-resistance, enabling manufacturers to make improvements in many parts.

You can expect more great things to happen at Great Lakes Steel. For we aim to serve well our many customers in many fields. Great Lakes Steel Corporation, Detroit 29, Michigan.

# **Great Lakes Steel**



nsear to supply industry s, ls 0

Illustration: New "D" blast furnace, Great Lakes Steel.

# DeVilbiss helps you get the most from the spray method



20% DROP IN REJECT RATE—Small wonder Ralph Parsons, Foreman of the Paint Shop at Argus Cameras, Inc., is pleased as he examines the lamp housing from one of the new "300" projectors. The rich, wrinkle finish is applied with DeVilbiss spray equipment.



48% SAVINGS IN SPRAYING TIME— Lacquer spraying time was cut in half by using an automatic spray setup.



20% SAVINGS IN SPRAY MATERIAL— Correct air and fluid pressures give this Argus C-Four its handsome finish.

# DeVilbiss helps Argus save \$1,660 a year in painting single camera part

Argus Cameras works with

DeVilbiss Production Service to increase production,
reduce rejects, save time and material

Argus Cameras, Inc., Ann Arbor, Michigan, is well known as one of America's leading manufacturers of fine camera equipment. Recently, starting production on their new "300" projector, they found unit labor costs and rejects were running too high in the paint shop.

Argus called in DeVilbiss Production Service. An on-the-job analysis of the entire Argus painting operation was made and specific recommendations for improve-

ment were given. The results were eye opening:

A savings of \$1,660 a year on direct labor cost for painting a single camera part. A savings of 48% in actual spraying time on another part. A savings of up to 20% in spray material for individual parts. A drop in rejects of 20% on the projector lamp housing.

There were other benefits, too. Workers respected the DeVilbiss expert. He held training classes and showed ways to improve their spray painting technique. And six months later, their efficiency was still on the rise!

DeVilbiss helps you get the *most* from the spray method. If you have a spray-painting problem, DeVilbiss will help you solve it. Service doesn't stop — it just *begins* when you order DeVilbiss equipment. For full information, contact your nearest DeVilbiss jobber, branch office, or factory.

# THE DEVILBISS COMPANY Toledo, Ohio

Barrie, Ontario • London, England Santa Clara, Calif. Branch Offices in Principal Cities



Spraying saves one-fourth the time . . . up to 50% in overall painting costs. On many surfaces, like acoustical tile, it is the only practical method.



Automatic spraying is cutting costs for many manufacturers. DeVilbiss has a wide variety of standard automatic spraying machines to serve you.



For fully coordinated spraying equipment: spray guns, air compressors, spray booths, hose and all necessary accessories, DeVilbiss can serve you best.



JANUARY . 1954 finish

# THE finish spotlight

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Chilled drinks flow readily from the Aqua-Tap dispenser built into the door of a new Deepfreeze refrigerator. A glass is filled merely by pressing it against the Aqua-Tap. When the glass is removed, flow stops driplessly. Water, fruit juice or other beverages, except milk, may be served through the tap which is supplied from a gallon-plus plastic container inside the door.

# Introducing

# The newest member of the Ferro Family

We would be ungrateful if, at the very beginning of this announcement, we didn't thank our many friends for the business they have given us. On our part, we have made a real effort to merit your business. This, we will continue to do.

To permit expanded production of Monotube® Surface Units for electric ranges, we have moved all other rod-type heating unit manufacturing from Chicago to a new plant in Batavia, Illinois. This new division will be known as Ferrod Mfg. Company, a wholly owned subsidiary of the Ferro Corporation.

H. F. (Deke) Bond will manage this new operation and has brought together a capable, experienced team to help him in the task. The new plant is already in production. And here, too, we have ample space for expansion.

It is our hope that through these moves we will be able to serve you even better-from Tuttle & Kift in Chicago; from Ferrod in Batavia; and from our third subsidiary in the electrical field, Ferro Electric Products, in Kirkland, Illinois.

For the business that has made this growth possible, we are deeply grateful.

RaWeaven

Chairman, Ferro Corporation

# McDANEL

# Super High Density Mill Linings

# A Superior Ceramic Lining for Ball Mills

These bricks contain a high percentage of Alumina. They are harder, and last longer than the standard porcelain bricks, and the pick up due to wear is less.

Authenticated records of tests over a period of years prove that McDanel Super High Density Bricks will outwear Porcelain Linings two and a half times to one under average routine use.

This means that fewer relinings are required, and an important saving in down time.

McDanel Super High Density Mill Lining Bricks can be furnished, on special order, with double taper for use in conical continuous mills, and also in lifter bar shapes for special needs.



Write today for our new catalog—just off the press—containing complete data on McDanel Porcelain Products



McDANEL REFRACTORY PORCELAIN CO.
BEAVER FALLS, PENNA.

Tank & Dryer Linings—Special Mill Lining Shapes—Porcelain Grinding Jars & Mills—Metal Covered Grinding Jars & Mills—Door Lining Blocks



# MODERN STYLING STARTS WITH A MODERN METAL

The eye appeal of brilliant metal in modern product design is undeniable. Whether used functionally or for decorative trim or both, pride of ownership is established. The buyer wants more than utility...he wants the warm glow of possession of an article that is smart-looking, stylish, attractive. Nickeloid Metals, with their durable, plated finishes of chromium, nickel, brass or copper should be considered in your program of product design. These metals are beautiful and easy to keep that way. They are easy to fabricate. They are available in sheets or coils, bright or satin, and in a range of interesting crimps and stripes. They can be etched, silk-screened, or lithographed. They can be adhered to wood or paper board. American Nickeloid Company wishes to assist in your design activities by making working samples available to you.

NICKELOID METALS

**Product Designer's Paradise!** 

More than a Metal - It's a Method

# PRE-PLATED FOR ECONOMY

The cost-minded executive will at once appreciate the production advantages of Nickeloid Metals. Being pre-plated, they are immediately ready for assembly when stamped or formed. They require no further costly steps of plating or polishing, with the attendant handling and cost of rejects. Nickeloid Metals come to you as a beautifully finished raw material. And the quality of finish meets the highest of standards, for we have been supplying pre-plated metals for over half a century. Utilize this kind of plating experience by asking to have a sales engineer call on you.

Quality Metals Since 1898

# AMERICAN NICKELOID COMPANY

ADMINISTRATIVE OFFICE: Peru 20, III.

MILLS: Peru, III. and Walnutport, Pa.



Again we can say — The issue of finish in which this editorial appears carries a greater number of pages (both editorial and advertising) than any preceding issue of its ten year growth. But we hope that it shall never be said that the measure of success for our editorial efforts is in the number of pages. We would like it to be measured in the value of our service to readers, which can best be judged by the verbal and written comments to our editors.

# A QUICK LOOK-PAST AND FUTURE-

will be included in this, our 10th anniversary editorial, as we begin our 11th year of publication.

# A prediction — February, 1950

1950 can be a boom year — for major appliances and other metal products for the home. With a reasonable degree of stability in the supply and prices for raw materials, in the labor market and in the retail sales prices for finished products, the total sales from major appliances and allied metal products may hit a peak for 1950 higher than for any other period.

# History did well by this one.

# A suggestion to manufacturers --- February, 1950

The wise manufacturer is the one who realizes that to carry this desirable situation (the current "boom" in metal products sales) through the year means additional selling aids for distributors and dealers, endless sales training, and advertising and sales promotion at the retail level planned on a basis of increasing competition for the consumer's dollar.

# Many manufacturers let us down on this one.

# More of the same - October, 1950

As we have said repeatedly, there are a few outstanding manufacturers who are doing a thorough job of sales education and training work from factory level to the retail floor. There are many more in the appliance field, however, who are continuing to concern themselves primarily with the production and "disposition" of their finished products without sufficient attention and cooperation at the retail level to insure a satisfied user, or, in other words, an actual "sale."

# More water off the duck's back.

## The real job is at the retail level - July, 1952

NOW, four or five years late, these same manufacturers are frantically trying to get their sales organizations into shape so that there will again be an attempt made on the part of dealers and dealer-salesmen to actually sell the finished products instead of waiting for customers to come into the store and plead for merchandise.

This work is beginning late — very, very late — but it still has to be done, and those manufacturers who are not turning every possible bit of manpower and sales effort to the job of accomplishing constructive selling at the retail level may expect to be in a bad spot, indeed, for the months to come.

# Some are still beginning.

# Shirt sleeve selling - October, 1952

Regardless of your efforts and the capabilities of your factory salesmen, you aren't going to get the retail salesman down to earth and operating on a "shirt sleeve selling" basis overnight. You won't get him to do it now at any price, but the sooner you set this problem up as your No. 1 goal, the sooner you will start to achieve some degree of success, and it must eventually be achieved.

The only sure way of keeping expanded production facilities operating at profitable capacity is to "get down to earth" and back to many of the selling fundamentals and selling plans that helped to build the multibillion-dollar appliance industry during its formative years.

## Still plugging.

# For the future

You may be sure that the manufacturers whose products sell in volume (starting now) will be using every ounce of advertising and selling power at their command. The sleigh ride is over!

Forecasts in the metal products field are for excellent business in '54, only slightly down from 1953, and for some products an ascending scale.

We normally publish a forecast for gas and electric appliances in our February issue.

An advance peek at the electrical appliance forecast shows "excellent business prospects for 1954" — look for 3 to 5% decrease in total appliance dollar sales, with increases for some.

See Mr. Dadisman's approach to '54 on page 44. The steel and raw materials producers as well as the finished products manufacturers are stepping up advertising and sales.

Yes sir, for the manufacturer who has been planning for today, and is prepared with strong selling and advertising, the future can be a bright one.

Dana Chase

EDITOR AND PUBLISHER

# It's as simple as that...

"OUT OF OUR CARTON - INTO YOUR DOOR"

# **PERMA-VIEW**

..THE WINDOW YOU CAN SEE THROUGH

Always....



CROWN STOVE WORKS is offering PERMA-VIEW oven door windows "as optional equipment on all models at the present time", according to J. C. Rogers, Vice President — Sales



Yes sir, it's as simple as that. The PERMA-VIEW oven door window comes to you ready for immediate installation in your range—to add a sales feature second to none, as the demand grows for "visible baking."

The strong steel encased, double pane PERMA-VIEW window incorporates the finest quality heat resisting glass. It is mechanically sealed to prevent infiltration of vapors and to eliminate "fogging."

More and more range manufacturers are turning to PERMA-VIEW as a practical, economical and effective sales feature for their new models. We will gladly work with your engineering department in adapting its use to your new range. Write for complete information.



PRODUCTS, INCORPORATED

1015 W. MAPLE ROAD · WALLED LAKE, MICHIGAN

## ONE OF A SERIES OF ADVERTISEMENTS ON THE HISTORY OF ELECTROPLATING



# a midnight sale that opened the door to new plating profits

Back in 1934, Udylite's young president, L. K. Lindahl, threw the necessary parts for a complete plating barrel into his car and headed for Kokomo, Indiana. He arrived at midnight. His prospective customers — a plating shop owner and the superintendent—were waiting for him.

On the shop owner's desk, Lindahl assembled, disassembled and reassembled the barrel. It was a perfect machine fit of parts picked at random from stock. It was the first barrel providing perfect assembly of standard parts! Easily removable panels and other superior features of the barrel completely sold both men. Udylite got the order!

The months of research by the Udylite technical team had paid off! The barrel was unique because it was made from a material heretofore untried . . . hard rubber. In addition, electricity was conducted

through the ends of the barrel by easily removable contacts. This first Udylite Barrel had again provided a better way in plating.

Udylite knew they had the best unit in the industry—one that upped production, cut costs, saved manpower. But the "midnight sale" proved the acceptance and value of this revolutionary product.

In the following years, Udylite Corporation continued to pioneer improvements and innovations in plating barrels. Bakelite, hard rubber and melamine materials were followed by the present super-resistant lucite plating cylinders. But that's not all! Udylite engineering and research teams are constantly at work perfecting still better materials, methods and equipment . . . all designed to give you better plating at lower cost.







# From raw material to finished product

Part I—a review of the early history of metalworking

by James M. Leake . PRESIDENT, THE LEAKE STAMPING COMPANY, MONROE, MICHIGAN, TECHNICAL CONSULTANT TO FINISH



Our subject is descriptive of the broad scope of this magazine, a publication that portrays "Metalworking from start to

finish." It is far too important a theme for citizens to ignore its importance to their welfare. In fact, has anything contributed more to the material comfort and happiness, of earth's inhabitants than metalworking?

Metalworking is one of the oldest professional sciences known to man. Extensive knowledge of most of the common metals of our day has existed for approximately 6,000 years. Metalworking satisfies the dictionary definition of engineering, for it embraces "The conversion of natural products into products useful to man."

The authentic history of "the creation" includes an account of the abundance of good quality gold. The seventh lineal descendant of Adam was the first recorded Dean of Engineering, for Tubal Cain was the name of the pioneer "instructor of every copper and iron worker in the land." He was one of a family of renowned professors.

Traditional designs on metal objects that have been unearthed under an ancient palace of that area point to the metalworking of that age. Knives of that collection are considered to be about 5,000 years old. Other iron articles have been discovered at Thebes. Iron sickles were engraved on the walls of the tombs

of Memphis. In fact, iron tools were used in building the pyramids.

# Iron smelting — forty centuries old

The knowledge of how to smelt iron from ore has existed for almost forty centuries, and much of the iron was produced by that process. Other iron rained from the heavens in the form of meteors. The latter objects are often impregnated with nickel, which makes it ideal for forging the edges of cutting tools, but in early times the great abundance of iron was not fully realized.

# **Editor's Note:**

Mr. Leake was asked to prepare an appropriate article for our 10th Anniversary Issue. When submitting the accompanying article, "From Raw Metal to Finished Product," Mr. Leake said: "It was my thought that in an Anniversary Issue, a review of the past, a reflection on the present and a remark about the future might be well received by your readers."

The article and illustrations are a study in contrast — the text starts with early history (Part I, this issue) and carries through to the large presses, wide sheets and tailor-made metals of today (Part II, February), while all illustrations represent modern stamping practice.

During the time of the patriarchs, metals that we consider as precious were widely used. We have been told that, "Abram was very rich in cattle, in silver and in gold." The people adorned themselves with golden jewelry. The Children of Israel melted their ear-rings when they cast

their celebrated "Golden Calf." The goldsmiths "beat their gold into thin plates and cut it into wires," while bowls were wrought from copper and silver.

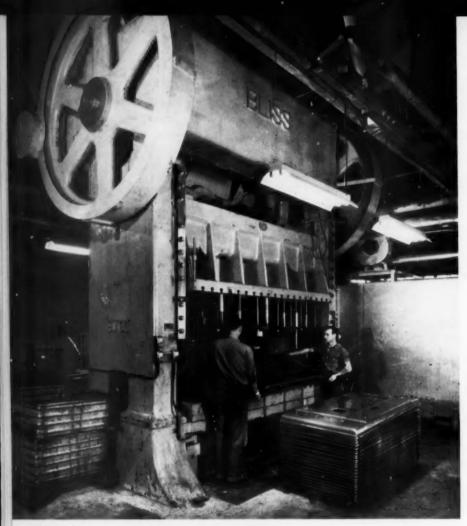
Bronzes are usually credited with being our oldest alloys. They are made by combining copper and tin in varying proportions. The resulting metals are much harder than either of the original components. Perhaps brass, which is largely an alloy of copper and zinc, made its appearance shortly after bronze. Pewter is an old alloy used by the Chinese and Egyptians.

# Metalworkers and

## Solomon's temple

Celebrated metalworkers built a substantial portion of Solomon's temple. Its huge pillars and much of its ornate surfaces were made of bronze castings. In fact, the accumulation of wealth was so great during Solomon's reign that neither silver nor bronze were held in high esteem. It was called the bronze age. Measured by today's values, the precious metals used in the construction of the temple sounds fantastic even in this day of superlatives.

In his role as the builder of civilization, man's advantage over other creatures lies in his determination to improve his conditions, make progress and be independent. Civilized man learned that with the development of tools, no matter how crude, that more work can be accomplished with less effort. They made tools such as awls, tweezers, knives and needles. They made weapons such



The trim, pierce and hole cut operation on vending machine door panels of 18 gauge steel. Operation is on a 500-ton mechanical double crank press, with a bed area of 120" x 60".

# VENDING MACHINES

Portable expansion gun spot welding is employed here to combine these fabricated metal components into a door panel assembly for a typical vending machine.



as lance heads and battle axes.

These pioneering metalworkers became specialists. Productivity was increased. The people had more food and raiment, and more products to sell. Peaceful trading replaced brutal raiding of nearby tribes. Nations learned the languages and customs of their neighbors. Cooperation benefited all and proved harmful to no one. Production, trade and friendship moved forward together.

Trading centers were established in the far flung outposts of civilization. Boats were built to accommodate this expanding commerce. Metals and coins were introduced as new mediums of exchange. Distant savages marvelled at the new ingenious miracles. The pattern of the new metalworking industry emerged in remote areas. The continued success of each venture depended on continuing the formula that led to original success.

But history fails to report this to be the trend, for leadership soon drifted from nation to nation. The importance of trade, industry and commerce first shifted from the Egyptians to the Grecians and then to the Romans. Each civilization declined as soon as the people lost their desire to work. We all know how they built amphitheaters and spent half their time watching contests of wild beasts while people were starving.

# Metalworking in a coma

It was during this lethargy that metalworking lapsed into a coma. Millions of people might have enjoyed our daily comforts centuries earlier if they had steadfastly pursued their original objective. It was by their desire for an effortless existence they retarded progress for a thousand years and reverted to the laws of the jungle, the primitive state of men who have lost their inspiration.

The spirit of industry, trade and commerce was rekindled in the Middle Ages. Brisk trading was carried on with all of the then known world. It was the necessity of finding a shorter route to India that is credited with the discovery of America. It was an era when knights fought in metal armor with glistening metal swords. An early English king con-

JANUARY . 1954 finish

sidered his iron frying pan and pots as part of his royal jewels.

Then came the Renaissance, the gateway to modern development. England became the scene of increased activity. Competition provided the greatest impetus, for it led the search for better tools and lower unit costs. Single inventions paved the way for new industries while new developments in the application of power to machinery improved the output of all industries.

Factories had scarcely shifted their operations to make use of water power before the advent of the steam engine. Steam was used to increase the productivity of agricultural machinery. Transportation was also given considerable attention. Steam engines made rail transportation a possibility. Steam engine-driven ships gradually replaced sailing vessels in the competition for world-trade.

## Mechanization and employment

Fears that this mechanization would create unemployment proved to be unwarranted. In fact, the opposite was true. Greater production and the resultant cost reduction brought more products within the buying range of the multitude. England freed the slaves because of their increased wealth. Freedom, industry and prosperity went hand in hand, but failed to erase class distinctions.

The American colonies exported raw materials to England in exchange for manufactured products. Ultimately many Americans considered the possibility of producing their own products and entering them in competition in the world markets. Competing nations tried to prevent America from making and selling these products in competitive channels.

Efforts were made to levy taxes on imports to the American colonies. This led to a retaliatory boycott on goods from nations seeking to restrain our trade. As the situation became more intolerable, America declared its independence from outside interference in matters of national policy and subsequent victory made this policy permanent. In the years that followed, the United States became a great producing nation and developed world-wide commerce.

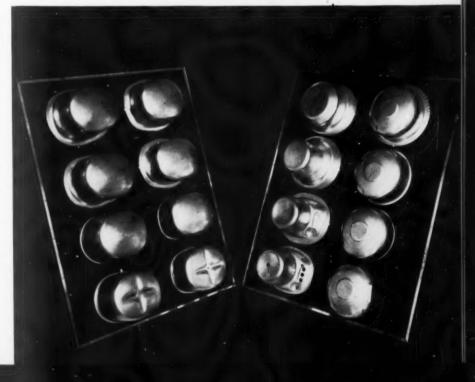
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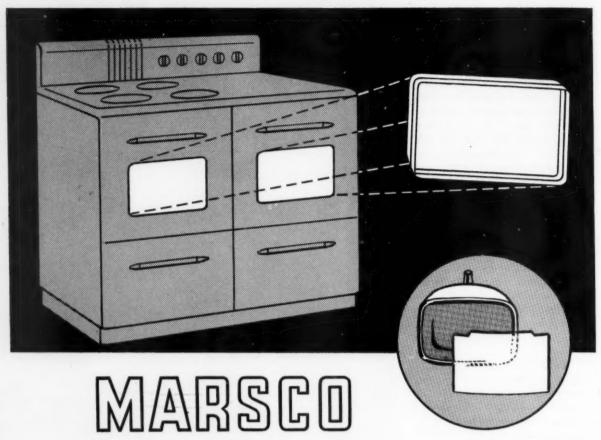


One of the many press operations required in refrigerator and air-conditioner production is shown in this example of deep drawn metal stampings for hermetically sealed compressor units.

# REFRIGERATION

This assortment of domes, varying in size, shape and metal thickness, represent other examples of deep drawn metal stampings for hermetically sealed compressor units.





# precision glass parts

# FOR UTILITY AND BEAUTY

Glass — enhances the beauty and broadens the acceptance of your product whether in the utility appliance field or the growing electronic industry.

Glass — adapted with skill and precision by MARSCO to meet your product requirements — For Today — For Tomorrow.

Glass — flat as can be — precisely shaped to fit.

Glass - bent-convex-drilled-to the most exacting tolerance.

Glass — hardened, heat-treated or tempered to survive your consumer usage unscathed.

Join the major appliance manufacturers now enjoying extra sales from the appeal and prestige contributed thru the luster of glass — MARSCO'S Crystal Clear Glass.

Our engineers are experienced in incorporating glass as viewing windows in domestic appliances and television cabinets.

A simple request to us solves your problem.



Bent Glass



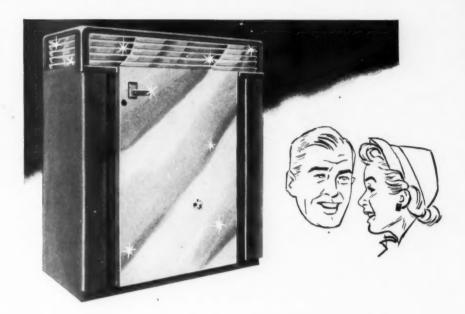
Convex Glass



Heat-treated Glass

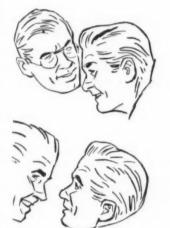


MARSCO MFG. CO., 2909 S. HALSTED ST., CHICAGO 8, ILL.



# **ENDURO BRIGHTWORK...**

# gets them all talking SALES





People are favorably impressed by well-chosen ENDURO Stainless Steel brightwork.

It's an unmistakable sign of top quality in a manufactured product. It's a point to talk about as another reason for choosing your line.

And, there's no reason why your products shouldn't have this sales advantage now. You and your suppliers can fabricate ENDURO Stainless Steel on your present equipment with little or no change in procedures. There's no plating, painting or other finishing needed. As compared with forming, then cleaning, then plating, then polishing; cost is very attractive.

With ENDURO, you have brightwork that stays bright. It resists rust and corrosion, doesn't tarnish. It has no plating to chip, peel or flake. It's superbly easy to clean and to keep clean. It stays bright for the life of the product.

When your sales staff can point out to distributors and jobbers that your brightwork is genuine ENDURO Stainless Steel . . . when distributors can tell dealers . . . when dealers can tell their customers . . . and housewives can tell one another . . . then you've got them all talking sales! Republic will help you choose proper ENDURO Types and fabricating procedures. Write:

# REPUBLIC STEEL CORPORATION

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Republic REPUBLIC STEEL STEEL

Other Republic Products include Carbon and Alloy Steels—Pipe, Sheets, Strip, Plates, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing



# HOM

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### **Editor's Note:**

In the April, 1952, issue, finish started a series of editorial features, "How White is White," to investigate the interest in, and the possibilities for, standardization of white for home appliances. This project is still very much on the fire, and is presently in the good hands of the NEMA Committee on Color of Kitchen Appliances, plus a special committee set up more recently by the Inter-Society Color Council.

In our early approach to the editors of leading magazines in connection with the "How White is White" program, we had an interesting answer from Charlotte Eaton Conway, of House Beautiful Magazine. Said Mrs. Conway: "Had your suggestion of a standard white for kitchen and laundry appliances come ten years ago, or even five, I would have said it was most timely. In 1952, however, the finishes problem is quite different, in my opinion. The reason is that the trend in kitchen design and kitchen planning has changed materially. What people want now is some version of the living-kitchen idea . . . "

We devoted a 3-page letter to an explanation of the inherent difficulties and inefficiencies of attempting to run multiple-color products on today's straightline appliance production lines. We were convinced at the time that the big producers of home appliances would have slight interest in producing colored products.

It would appear that the wind has changed in the appliance field, for "home appliances in color" are to be in evidence on the floors of dealers during 1954.

With this change in view, we felt it in order to invite Mrs. Conway to present a few thoughts on the subject in this 10th Anniversary issue of finish. Her comments are presented on this spread.

Although all of her thoughts may not sound practical to your editor, we are ready to acknowledge that the point has been reached where "salability" may readily override many of the "practical" aspects of manufacturing.

We still hope for a practical standardization of white finishes, but stand ready to keep our readers fully informed on the subject of "color" also.

# a guest EDITORIAL FEATURE n

by Charlotte Eaton Conway

# EQUIPMENT AND APPLIANCE EDITOR !

HB

# HOUSE BEAUTIFUL MAGAZIN

You ask for House Beautiful's point of view re Colond r for Appliances.

From our own observation and from conversations will home owners, architects and decorators all over the country plis we arrive at but one conclusion: the trend is toward living his kitchens. The living-kitchen idea implies, without question suit the use of color in the kitchen — as contrasted with labor wold tory white. This trend has come about, not because some net "name" decorator recommends color. But because of basing economic and social conditions which mark the times view live in. And architectural trends come in for their share used responsibility.

It hardly needs the saying that "servants" have move out of the kitchen, and Madam herself has moved in hithose now bygone days when Madam never went near the kitchen, she didn't care what it looked like. Now that she in the kitchen many times a day, she wants it to be a pleasant, decoratively speaking, as any other part of the house. And this means color.

Our social pattern today has left behind with the servant the stiff and stuffy formality of Victorian days, and enjoy a natural, healthy, casual way of living that invitate whole family and any and all guests into the kitche They don't want to stay long, though, if their surrounding make them suspect they are in an operating room or chemical laboratory. The warmth and friendliness and live

# PPLIANCES IN COLOR

9-kinplies, without question, the use of color in the kitchen — steel ptory white".... color will be on the floors of dealers during 1954

ity of color, on the contrary, makes them feel as much home in the kitchen as in any other room of the house.

Open planning of houses, considered by architects to be
the of the best ways to get the feeling of spaciousness
en in small quarters (high cost of building comes in here)
ten leaves the kitchen wholly or partly in view of anyone
to comes into the house. With warm wood, brick, and
numerable other materials used on the inside of houses,
would hardly make sense to break the design continuity

1101 th a stark white kitchen. So, often, we have the living
om colors and materials carried into the kitchen.

Anyone at all close to the appliance business recognizes at consumer desire for color in cabinets, ranges, refrigerence in the consumer speaks and obvious headness for the industry, at all levels — manufacturing, distributing, retailing. Yet, the consumer speaks her piece, at Color d most industries find it is better business to go along the her, rather than to fight her.

ons will The solution might possibly be a "rough" finish for country pliances, which could be finished by the retailer, or the divine namer herself, with a sprayed-on or brushed-on finish question suit her taste. The matter is highly technical, of course, a labora volving a final result satisfactory from both aesthetic and see some actional standpoints. But American technicians have accord has implished wonders in the past and I see no reason why imes well could not cope with this problem, too, if they recogshare used its importance. The refrigerator manufacturers, for stance, are worried as to how they are going to sell more rigerators, when sales have reached something like 90% in it saturation. Color would be a Shot-in-the-arm. Another near the ample of a color trend just beginning to be recognized,

is held by a few far-seeing manufacturers of small electric appliances (coffee-makers, toaster, etc.). For many years these have been offered exclusively in polished chromium, under the far-fetched illusion that it looked like table silver. Now some trade factors are beginning to wonder if colors, or possibly brass or copper, would not be more home-like, living-room-y, and less institutional.

One of the reasons the component range has been so successful — and you know how many brands there are now on the market — is that they are not white; just a softly glowing stainless steel or copper or other metal finish which is more home-like and harmonious with other kitchen elements than the whiteness of the conventional range. And look at the number of home owners who are going to refrigerator and freezer firms catering to institutional requirements, who are ordering built-in refrigerators and freezers with stainless steel doors, for their own homes. Surely this must give pause to manufacturers of conventional white refrigerators and freezers.

The trend to color is everywhere about us; tooth brushes, pencils, scratch pads, emery boards, the most ordinary day-to-day kind of article. To say nothing of decorative elements like wallpapers, carpets and rugs, floor tile, textiles, etc. Why appliances should be any different, and still go on presenting a sterile white appearance, we cannot see.

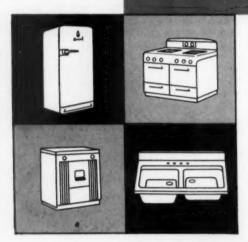
Until and unless, economic and social conditions and architectural trends change materially,—and we cannot see that in the foreseeable future—it looks to us as if color in the kitchen were here, and to be reckoned with by the appliance industry.

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# Here's Evidence

# Diant Tested COVER COAT FRITS



Here at Ing-Rich we cannot afford to take *any claims* for granted. We operate one of the largest job enameling plants in the country *and* . . . we produce our own FRITS.

Guesses, claims, experiments . . . NO. We would not have held our large job enameling clientele thru the years unless we made SURE first, thru laboratory and Plant Testing, that our Cover Coat Frits would do the job required.

# We offer you PLANT TESTED EVIDENCE

Makes no difference as to the product you enamel. Here at Ing-Rich we are going through the same enameling problems day after day . . . not guessing, not experimenting

... making sure of the workability, the versatility of Cover Coat FRITS which we produce, not only for our own use...but... also for the use of our many satisfied FRIT customers.

# Will you let us prove our case?

Without obligation, one of our Service Engineers will be glad to come to your plant and give you EVIDENCE of the better results you can achieve with *Plant Tested Ing-Rich Cover Coat Frits*.



OFFICES, LABORATORY AND PLANT FRANKFORT, INDIANA

# Adherence tests for porcelain enamels and high temperature ceramic coatings

Part I — discussion of destructive type tests and complete information on the Porcelain Enamel Institute standard adherence test

# by George Warren . THE PFAUDLER COMPANY, ROCHESTER, NEW YORK

ESTS that have to date obtained popularity for evaluating the adherence of conventional porcelain enamels to metal have been destructive tests. The tests described in this paper are based on the premise that the amount of enamel remaining attached to the metal after it has been systematically deformed is a measure of the bond that exists between the enamel and metal.

### Review of non-standard tests

Sams1, of Armco Steel Corporation, reported in 1940 that the relative adherence of porcelain enamels on specimens that had been elongated beyond the elastic limit could be readily evaluated. Figure 1 is taken from the report of his work. The steel specimen, coated with dark ground coat enamel, was elongated various amounts as noted. He concluded that eight per cent elongation is a desirable amount for comparison of the adherence of different specimens. This test has the advantage that the amount of deformation is unaffected by the thickness of the metal. Sams indicates that any theoretical effect of differences in metal thicknesses can be neglected. The necessity, at least in the past, of performing this test with heavy duty, tensile testing equipment has probably been a serious deterrent to the general use of the stretch test. However, a special apparatus could probably be designed for this purpose so as to place the required equipment in a lower price range.

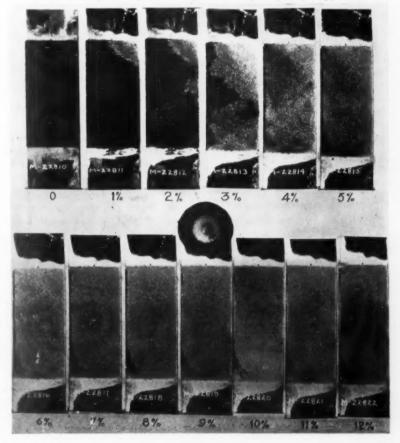
The porcelain enameling industry

has depended almost exclusively during the past several years on a spotdeformation type of adherence test. Several types of apparatus were used to obtain such deformations, for ex-

- 1. A freely wielded ball-peen hammer
- 2. A falling pendulum<sup>2,3</sup>
- 3. A falling weight<sup>1,4</sup>
- 4. A mechanical or hydraulic press<sup>5,6</sup>

The falling-weight type of apparatus has been widely used and one design incorporating this principle is shown in Figure 2. The weight falls onto a round-end cylindrical plunger or ball which forces the enameled specimen into a bottomless hole in the metal block on the under side of the specimen. This apparatus has never been standardized and as a result the various pieces of equipment in industry differ in many re-

Figure 1 — One specimen at varying percentages of stretch. Insert at 9% shows companion specimen impacted with falling weight apparatus.



When this paper was prepared, the author was research fellow of the Porcelain Enamel Institute, National Bureau of Standards.

finish JANUARY . 1954

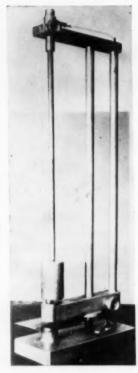
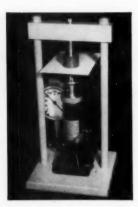


Figure 2-Falling weight type adherence testing apparatus.

Figure 3 -- PEI deforming press with specimen for adherence test.



oped a pressing need for a quantitative adherence test that is not subject to the errors of human judgment in the numerical expression of results. Such a test has recently been developed by the Porcelain Enamel Institute Research Associateship at the National Bureau of Standards. Figure 3 shows the hydraulic deforming press used in this test. A specimen not less than 4" x 4" is placed on the die that is supported by the ram. The ram brings the specimen against the 1-inch diameter ball which then deforms the specimen far beyond the yield point of the metal. The specimen is deformed to 2000 lbs. total load as indicated by the hydraulic gage. The dimensions of the dies are shown in Figure 4 and Table 1. It will be noted that in contrast to the bottomless hole used with the drop-weight apparatus, these dies have controlled depths.

The PEI adherence test procedure<sup>6</sup> specifies separate dies for deforming the various gages of metal thickness from 14 to 26 gage-the thicker the metal the less the die depth. If a single die were used on all gages of metal, adherence would ap-

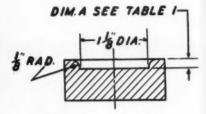


Figure 4 - Cross-section of deforming die.

pear poorer on thick metal than on thin when, in fact, the adherence is the same. The five dies tend to put the various gages on a comparable basis. Table 1 shows the dies that are to be used with the various metal thicknesses. Research die "X" is the deepest die provided and is the limit of depth to which a specimen can be deformed for test with the adherence meter. Figure 5 shows the complete set of dies. It can be seen that a choice of severity of treatment to any specimen can be made. This may be desirable in research and development work. For instance, if an enamel gives very good adherence on 14 gage metal and it is desired to test it under more severe





In recent years, there has devel-

spects, such as weight of the falling

object, size of the ball or plunger,

and size of the receiving hole. This

test has the disadvantage that even

though heavy gages are deformed

less than lighter gages the depth of

the deformation is not sufficiently

controlled to indicate equivalent ap-

parent adherence to specimens of

different gage even when the appar-

Tests designed to pull the enamel

away from the base metal without

deforming the metal, have also re-

ceived some attention as adherence

PEI standard adherence test

ent adherence is the same.

Figure 5 — Photo shows a complete set of deforming dies.



tests.7,8

ure 7 — Sectional asbly drawing of the adherence meter. Probes Counter reset knob Pivot bolt Pivot knob Elevator knob Specimen holder Spring supported plunger Safety lock Plastic guard

Circuit box

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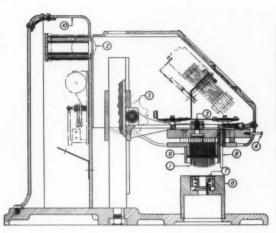
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M	Die Depthi (Inch)		
Nominal	Thickness Range		
Gage	At Least	Less Than	Dim. A
14	0.067"	0.082"	0.090
16	0.054"	0.067"	0.115
18	0.042"	0.054"	0.136
20	0.033"	0.042"	0.156
$\begin{bmatrix} 22 \\ 24 \\ 26 \end{bmatrix}$	0.016"	0.033"	0.176
Research	Die (X)		0.190

conditions, it can be deformed with any of the deeper dies. The deeper the die, the more enamel or coating comes off the metal, and hence, the more bare area exposed.

An electronic adherence meter samples the deformed area with a cluster of 169 needle-like probes to determine the relative amounts of bare metal and attached enamel present. Probes contacting metal complete an electric circuit which actuates a counter and thereby totals the number of such probes contacting. It is assumed that the difference between the counter total and 169 is a measure of the area protected with enamel. Figure 6 shows a photograph of the complete meter. Figure 7 shows a drawing of the mechanical parts. The probe cluster is suspended by

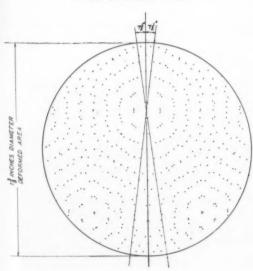
pivot bolt 3 which is located onequarter inch from the center of the cluster. Tests are made with the cluster in the neutral position as well as with it rotated 71/2 degrees to each side of center. Figure 8 shows the kind of sampling obtained with this method. The area within the circle represents the deformed area of the specimen. The dots show all of the points touched by the probes after being brought into contact at the three angular positions. The standard test procedure specifies that counter totals obtained at the three positions on each of seven specimens to be averaged and converted to percentage of area covered with enamel. This percentage is known as the "adherence index."

It is significant to consider the

NOTE: Dies are stamped with nominal gage value for identification, except only 24 is stamped on the die having depth 0.176 in. and X is stamped on the research die.

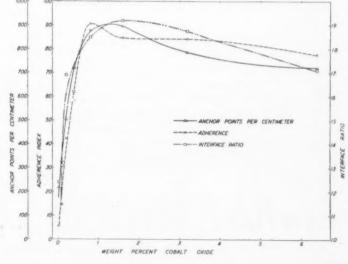
scatter of results (randomness) as caused by the deforming operation and meter testing as compared to that part of the scatter caused by the variability in adherence actually existing in different specimens. On the average, the scatter results caused by the variability of the specimens is four times greater than the scatter assignable to the instrumentation. It is common knowledge that in considering parent populations, a measurement is no better than the reproducibility of the sample being measured. Therefore, the precision of adherence tests are now largely a function of the reproducibility of the to Page 104 -> specimens.

Figure 3 — Sampling obtained with electronic adherence meter.



finish JANUARY . 1954

Figure 9 — Correlation of roughness of enamel-metal interface with adherence indices for conventional ground coat enamels.





# **OVER 15,000,000 POUNDS**



Over 15,000,000 pounds of Century ground coat frits have been prepared for application in this one mill by one of the country's leading manufacturers of fine gas ranges.

This large mill keeps on grinding Century frits, 6,000 pounds at a time, because the frits keep on producing the kind of trouble-free ground coat finishes that keep rejects down and adherence at its best.

It's the "grip" that counts in ground coats. This ability to "stay put" is of great importance to the modern kitchen range and to all metal products finished with porcelain enamel. Century time-proved frits will give your product this

\* Century produces a complete line of ground coat and covercoat enamels for all types of production porcelain enameling. same advantage and you can be sure of your enamel adherence.

You take no chance in specifying Century time-proved ground coat frits, except a good chance of saving money in enamel plant operating costs.

Arrange now for a trial run of Century time-proved frit.



# CENTURY VITREOUS ENAMEL COMPANY

6641-61 S. Narragansett Ave., Chicago 38, III.



# NO SUBSTITUTE for FAHRALLOY SERVICE

N addition to the sound engineering counsel that Fahralloy has rendered its customers for over 20 years, one of the most important things that has helped the company build the enviable reputation it enjoys in the alloy field is an intangible called out-of-the-ordinary service. This service isn't just any one thing, it's a combination of many. Net result - Fahralloy has come to be known for complete dependability! Fahralloy service has even gone so far in some instances of emergency to provide delivery by air with its company plane pictured above. Naturally, this is the exception rather than the rule, but it does show to what extent Fahralloy goes to provide that extra something in service . . . the extra something that assures complete customer satisfaction. There's no better time than now for you to experience it for yourself.

> HAROLD ROGGE • 2415 Fairmont Avenue • Walnut 4303 **DAYTON Area Representative**

CLARE CHARRON . 209 Curtis Building . Trinity 5-7633

# FAHRALLOY

150th & Lexington Ave. - Harvey, Illinois In Canada — Fahralloy Canada, Ltd., Orillia, Ontario



finish JANUARY . 1954

HEAT

WHERE THERE'S

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#### 1954 ICHAM OR

(left to right)

F. H. Guthrie, No. Stove, vice pres.,

W. Frank Fisher, | Wells, secretary urer

S. B. Rymer, Jr., Products, vice meetings

A. B. Ritzenthaler, To Stove, vice pres., berships

F. A. Kaiser, Dell Michigan, executive president

F. D. Hart, Temco,

# Stove industry management conference

THE Institute of Cooking and Heating Appliance Manufacturers held their 42nd General Stove Meeting and Management Conference at the Netherland-Plaza Hotel, Cincinnati, on December 7, 8 and 9. The meeting was billed as an "informal workshop or seminar for top industry executives in the management, sales, financial and technical fields."

What was described by some members as one of the most interesting programs in recent years included division meetings and general sessions keyed to the current problems of the heating and cooking equipment producers.

#### Don Hart heads ICHAM slate

F. D. Hart, executive vice presi-

dent of Temco, Inc., was elected president of ICHAM for the coming year.

### The president's report

C. M. Dunn, retiring president and president of RCA Estate Appliance Corp., in his report pointed to the error in accepting and fostering vague and pessimistic terms such as "when selling levels out," "over-production," "depressions," in that the situation is one where two-thirds of our existing equipment, is obsolete or semi-obsolete. While older equipment may still be functioning, the newer and more efficient replacements improve efficiency to the point where they can pay for themselves.

Any failure to move this newer and better material is due to lack of selling.

### "Operations Research" from top management's point of view

Professor Clay H. Hollister, head of the Department of Engineering Administration, Case Institute of Technology, discussed the growing acceptance by top management of "Operations Research." The trend was attributed to spectacular successes achieved during World War II, where it is credited with doubling the effectiveness of Great Britain's defense equipment.

Operations Research places in top management's hands a tool of scientific accuracy which can be applied

Photos on left were taken during luncheon meetings of following groups: gas space heaters, floor and wall furnaces (upper); domestic ranges (center); and solid fuel stoves (below).



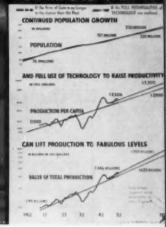
finishfotos





A quartet of fun at the stove meeting.

ecutio



"Background for Tomorrow" and "Potentials for Tomorrow" as discussed by Murray Shields in his presentation.

to business as a whole, and resolve an indefinite number of inter-dependent variables. The OR teams have successfully handled as many as 120 variables.

#### "All your troubles - and more"

Jma Klep, managing director of CEFACD, Holland, presented a vivid comparison of conditions in the USA and Europe. The problems of ICHAM paled into insignificance as Mr. Klep reeled off a long list of day-to-day problems facing the European Manufacturers of Cooking and Heating Appliances - "Comite de Fabricants Europeens d'Appareils de Chauffage et de Cuisine Domestiques," as the Europeans call their institute.

Their problems of several languages; different types of distribution, discounts, and manufacturing methods; and variation in technical meanings impose obstacles to the interchange of ideas. Added to this is a low economic level.

Mr. Klep reported that even in 1953 the high cost of electricity suppressed electric range sales to a ratio of 1 to 100 gas ranges. Gas ranges were owned by only 6% of one group sampled.

Laws putting a ceiling on labor classifications, and requiring "governmental diplomas" for such occupations as stock clerks, etc., together with prohibition of incentive payments, have destroyed the desire of the workers to prosper by accomplishment and, in fact, resulted in absenteeism as high as 10 per cent.

to Page 115 ->



Snapshots taken during general session.





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ICHAM Academy Award Actors — left to right — W. B. Armel, Glidden; Walter F. Muhlbach, Dortch Stove; F. H. Guthrie, Newark Stove; A. R. Tomlinson, Martin Stove & Range; and F. A. Kaiser, Detroit-Michigan Stove.



J. L. Moore, of Coleman emceed the skit put on by panel shown on left.



# Kitchen cabinet manufacturers plan promotion program

Like most progressive industries, the manufacturers of steel kitchen cabinets are working together under the banner of their cooperative association to promote the mutual interests of their industry and to improve their relative position in the competitive market for all types of appliances and other fabricated metal products going into the home.

Steel Kitchen Cabinet Manufacturers Association held its quarterly meeting at the Edgewater Beach Hotel, Chicago, on December 9, with the chief topics for consideration: Sales promotion and advertising, trade statistics, packaging, transportation and traffic.

M. M. Miller, president of Miller Metal Products, Inc., Baltimore, Md., is president of the organization; F. E. O'Connor, vice president of Geneva Modern Kitchens, Inc., Geneva, Ill., is vice president; and Arthur J. Tuscany, Jr., is secretary-treasurer.

Together with Mr. Miller and Mr. O'Connor, the following men comprise the Board of Directors. C. D. Alderman, Mullins Mfg. Corp.; Davitt S. Bell, Tracy Mfg. Co., Div. Edgewater Steel Co.; T. W. Hardy, Murray Mfg. Corp.; C. Fred Hastings, American Kitchens Div., Avco Mfg. Corp.; R. A. MacNeille, St. Charles Mfg. Co., and C. S. Motter, Morton Mfg. Co.

#### Cooperative promotion study

The industry, through SKCMA, is studying the possibility for a coopera-

Above — Reading clockwise: Wm. Marks, Universal-Rundle Corp.; Harry Lawrence, Capitol Kitchens; Clayton Fisher, General Electric; Fred Hastings, American Central; Donald Stahr, Elgin Kitchens; Chas. Motter, Morton Mig.; Arthur J. Tuscany, Jr., SKCMA secretary; Floyd Fennell, Universal-Rundle; Harvey Knuth, Lyon Metal Products; J. M. Olsen, Lyon; N. B. Downen, Morton; Quentin Garman and Tom Cole, Universal-Rundle.

Below — reading clockwise: Dana Chase, finish; J. R. Miller, American-Standard; C. A. Reinbolt, Jr., American-Standard; B. T. Roe, Tracy Kitchens; C. K. Reynolds, Republic Steel Kitchens; Leonard Rhodes, Lyon Metal; T. E. O'Connor, Geneva Modern Kitchens; M. M. Miller, Miller Metal Products; Jerry Schneider, Harrison Steel Cab.; William Klinkenstein, Palley Mfg., Marvin Berz, Marvel Metal Products; Richard Ralph, Harrison Steel Cabinets; Don Barber, Elgin Kitchens; Davitt S. Bell, Tracy Kitchens.



tive promotion program to sell the advantages of *steel* cabinets. It is expected that a suggested program will be presented on Wednesday, March 3, at a New York City meeting.

During its quarterly meeting, the Association voted to accept an invitation from the National Association of Home Builders to conduct one of six "How to do it" sessions at the Home Builders Show in Chicago, at the Conrad-Hilton. The plan is to show builders how to save time in preparing plans and rooms to receive steel kitchen cabinets, and to give them basic tips on time-saving methods for kitchen installations. Included will be information on hanging cabinets on brick or stone walls.

### Steel cabinets help other sales

Speaking for the Association, C. A. Reinholt, Jr., Manager of Product Lines for American Radiator and Standard Sanitary, and chairman of the SKCMA Sales Promotion Committee, stated that it has been repeatedly indicated that steel cabinets help dealers sell other major lines.

Steel cabinets are distributed through a multitude of various distributors and dealers. According to Mr. Reinholt, no small part in the current increase in demand for steel kitchen cabinets has been the work of so-called specialists in the plumbing, flooring, tiling and other specialty fields. These dealers who formerly considered kitchen cabinets as a small part of their business and had relegated them to a corner of their places of business, have now found that by bringing steel cabinets out to the front, sales in their major lines have picked up appreciably.

An alert dealer in a given specialty field can point out that since the kitchen must be rearranged for his specialty, it might be wise for the home owner to consider installing new cabinets of steel, as well as other types of improvements. Carrying this suggestion to its highest development, many dealers have established kitchen specialists who prepare design and layout suggestions for new kitchens. In addition to this, many dealers have their own installation crews, or have readily available contractors

to Page 105 ->



# HOTPOINT - ANOTHER SPRA - CON PAINT APPLICATOR INSTALLATION

Originators of Quality Flow Coating



The Hotpoint Dishwasher

Spra-Con finishing equipment helps top manufacturers of appliances and other metal products produce SMOOTHER, more salable finishes by providing equipment that employs modern application methods. The SPRA-CON PAINT APPLICATOR for prime coats provides the perfect base for the latest developments in finish coats.

Other Spra-Con equipment such as paint bake ovens, dry-off ovens, conveyors, phosphatizing equipment, and "on-the-roof" baking ovens, will round out a finishing department capable of maximum production with greatest economy.

Let a Spra-Con engineer check your plant for possible increased

production at lower cost.

The Spra-Con Company -

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#### PRESSED METAL INSTITUTE

To finish:

PMI wants to be among the many who will be congratulating you, and warmly so, at this time of the tenth anniversary of your publication.

To us, finish magazine has always meant something quite special because until you "adopted" the Pressed Metal Institute and the stamping industry about five years ago we had no trade publication which concentrated on the pressed metal industry.

Since that time your coverage of our conventions has been excellent, and your cooperation through republication of technical papers has done much to advance this Institute and the industry it represents.

Consequently now that we have established a technical department with a full time director we are looking forward to many more years of association with you.

Orrin B. Werntz Managing Director



# STEEL KITCHEN CABINET MANUFACTURERS' ASSOCIATION

To finish:

Congratulations to you on your anniversary of ten years' service to the appliance and metal products fields.

Although our industry is relatively small in terms of producing companies, the products we manufacture provide a vast number of small businessmen with a livelihood while they supply a necessary service and product to the consuming public. And as a final result, we are proud to have made our contribution towards easing the work load of today's housewife.

Your efforts in recognizing our goals and encouraging our achievements have been appreciated by our members. We wish you continued success.

Arthur J. Tuscany, Jr. Executive Secretary



# AMERICAN HOME LAUNDRY MANUFACTURERS' ASSOCIATION

To finish:

It must be exceedingly gratifying to you to me that you are very close to your Tenth Anniversary to think of how exceedingly far you have come invafter all, is a short period in the business world.

Those of us who knew of your activities before entered the publishing field on your own behalf no doubt of the outcome of this new venture of y Nevertheless, it is as gratifying to us as it must you, to compare your present with your past. In one decade you have reached a position of outstand unquestioned leadership with finish magazine.

You give superb industry coverage, and by now the least of this is the informed and comprehend manner in which you treat the special features who wup so frequently in your pages. From my selfish standpoint I am particularly grateful to for the cooperative spirit you show in handling news of our own industry, including the coverage give our various association meetings.

If I thought it necessary I would wish you cont success, but somehow I feel certain this is assure without any assistance from me.

W. R. De Presiden



# PACKARD MOTOR CAR COMPANY

To finish:

It hardly seems possible that finish has reached tenth anniversary, but since that is a fact may gratulate you upon this occasion.

Because of its service to the metal products I have had more than a casual interest in finish number myself among its most constant readers. It take this occasion to wish you several times tentional years of excellent editorial service to the practurers of fabricated metal products.

Best personal regards.

# INIVERSARY 1

1954



### HOTPOINT COMPANY

A Division of General Electric Co.

To finish:

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It is a pleasure to congratulate finish on your 10th anniversary. The growth of your magazine has kept pace with the expansion programs of Hotpoint and other leaders in the Appliance and Metal Products Manufacturing field. Your unbiased reporting of facts has made finish a reliable source of information.

We follow the aggressive editorial policies with interest as they frequently lead the way in new programs which are of direct benefit to the industry as a whole. With the fast moving developments in methods and materials, we will continue to look with confidence to finish for the latest reports.

Paul Gèrdes, Supt., Civilian Mfg., Plant #5



# AVCO MANUFACTURING CORPORATION

To finish:

I note that with the January 1954 issue of *finish*, you will be starting your eleventh year of publication of this magazine.

During the past ten years I have read with a great deal of interest each issue of *finish* as soon as it reaches my desk. . . .

I look forward to the receipt of each issue and continually find much information in it which I greatly appreciate having access to.

Congratulations on your past success and every good wish for your continued growth.

Kindest personal regards.

F. L. Meacham Appliance and Electronics Division



# NATIONAL ELECTRICAL MANUFACTURERS' ASSOCIATION

To finish:

At the direction of Mr. R. A. Rich, Vice President, Philco Corporation; and Chairman of the Major Appliance Division of this Association, I take great pleasure in extending hearty congratulations of the NEMA Major Appliance Division to finish on the occasion of its 10th Anniversary.

Leo K. Fox Recording Secretary Major Appliance Division



### TOWNSEND COMPANY

To finish:

When finish was conceived by you and your rather limited organization in 1944, I don't think any of us had imagination broad enough to have forecast the strides made by the appliance and metal products manufacturing industries. The past ten years of this industry have shown not only manufacturers' abilities to "catch up" with war delayed requirements but vividly displayed their ability to so improve design, manufacture, and merchandising that their industry enjoyed a phenomenal growth. Everyone here at Townsend is cognizant of the tremendous requirements for our products in this industry and of the almost unlimited potential for the application of our engineering know-how and production ability to further expand these requirements.

Over the past ten years, each issue of *finish* that has crossed my desk, both at United States Steel and here at Townsend, has served as a constant reminder of the growth possibilities of the appliance industry and that this field deserved our best efforts in supplying raw materials and component parts.

With kindest personal wishes and the best of success for you, your associates, and *finish* for many, many years to come.

Robert J. Ritchey Asst. General Sales Mgr.



### ARMCO STEEL CORPORATION

To finish:

When finish magazine published its first edition, our country was in the midst of a war effort, and thoughts of normal manufacturing and marketing were put aside. However, those of us whose job was to look ahead and plan for the resumption of peace-time marketing were told that ours was a mature economy . . . that we had to be satisfied with a stabilizing population and limited marketing opportunities.

How things have changed!

As late as 1946 our population forecasters were telling us that by 1975 our total population would be 162,000,000 people. As this issue of *finish* goes to press our population is just a few hundred thousand short of that figure . . . 21 years early! To give that population buying effectiveness, we find that national income has more than tripled since 1940.

During the last pre-war year 6,640,000 major appliances were produced. During the year just past, this great industry has turned out over 14,000,000 major appliances . . . an increase of 114%. And a further encouraging fact is that out of last year's production, over 5,000,000 of those appliances were items that were either not produced or made in very limited quantities before the war.

We look forward to a continuation of this favorable pattern of growth, and feel certain that at the end of the next 10 years, the new scoreboard will show another spectacular expansion.

> R. A. Dadisman, Manager, Market Development Div.

# PORCELAIN ENAMEL INSTITUTE, INC.

To finish:

I began my service with the Porcelain Enamel Institute in January, 1944, and so January, 1954, will mark a tenth anniversary for me as well as for jinish. Congratulations and felicitations!

The trade magazines of the industry, I feel, have done a magnificent job in disseminating information to the industry and in helping to coordinate its activities. finish has always been in the forefront of promoting policies designed to promote progress in the industry, and on this occasion of its tenth anniversary we wish to express the sincere appreciation of the Institute for the wholehearted cooperation that we have received in the support of our many activities. Mr. Chase and finish have helped make the Safe Transit movement so conspicuous a success.

Edward Mackasek Managing Director

## ROBERTSHAW-FULTON CONTROLS COMPANY

To finish:

In looking back over the last ten years, I can see a very comparable growth between your magazine, finish, and our Company.

Back in 1944, we were the Robertshaw Thermostat Company and since that date, have grown to be one of the major divisions of the Robertshaw-Fulton Controls Co.

Both your magazine and our Company have enjoyed the same type of growth along with the appliance industry and I feel that we have both been of service to that industry.

Frank H. Post, Sales Manager Robertshaw Thermostat Division

# CENTURY VITREOUS ENAMEL COMPANY

To finish:

Congratulations on your 10th anniversary of the publication of "finish." I well remember the difficulties you had getting started due to the paper shortages, government restrictions, etc.

One of the most important developments in the porcelain enameling field — Titania Enamels — occurred during the last ten years. I am sure the numerous technical and practical articles that were published in "finish" on this subject greatly benefited the industry.

I think your magazine is tops in its field, and again Congratulations.

R. L. Fellows Manager, Frit Division

### WILLIAM SHAW

**Public Relations and Publicity** 

Dear Dana:

I imagine you still have a vivid memory even after ten years of the circumstances which surrounded the founding of *finish*.

You got out your first issue just as Washington rationed paper, and especially in the case of new publications. Those people who did not know you very well figured, to paraphrase that old story about the German saloon keeper, that the first of finish might be the last of Chase.

Those of us who knew you better kept on betting on you, and how you have paid off!

I have watched *finish* grow from a modest, almost pamphlet-type product to the big, beautiful magazine it is today, and concurrent with that same evolution have been glad to witness its growth in editorial importance and valued service to an appreciative field.

Congratulations on all that you have accomplished, and our good wishes to you for a long and prosperous future.

William Shaw

SPECIAL WHIRLPOOL SECTION

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on mid. ed, us THE MAGAZINE OF COMPLETE AND AND Metal Products MANUFACTURING











# NOW... a foolproof, low-cost timer for washing machines and dryers!



Available with 1 to 4 single-throw switches Range: 30 - 60 - 120 and 180 minutes

Approved by Underwriters' Laboratories for 25 amps, 230 volts, 1/2 h.p. - A.C.

For the full story on this foolproof, low-cost timer get in touch with LUX today!





Look for the "MINUTE MINDER MAN" tag — it dramatizes the famous Lux Timer line found on America's finest appliances



THE LUX CLOCK MANUFACTURING COMPANY . WATERBURY 20, CONNECTICUT





# Whirlpool "TUMBLES" COST 37%

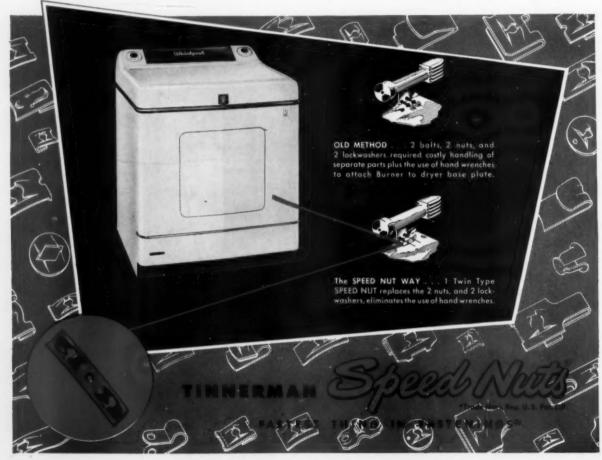
. . . on Clothes Dryer Burner Assembly!

How Whirlpool Corporation, St. Joseph, Mich., found Twin Type Speed Nuts savings of 37%... reduced Materials Handling 75%

Whirlpool engineers have matched the smartly styled beauty of this automatic clothes dryer with smartly engineered, cost-saving fastening methods! In the complete dryer assembly, they have specified more than 40 SPEED NUTS of various types! Their latest find is a neat 37% production savings through the use of Twin Type SPEED NUTS in attaching the burner assembly to the base plate, eliminating two threaded nuts and two lockwashers for an amazing 75% cut in materials handling!

No matter what you build or assemble, whether

you're in the design stages or in full production, there's a SPEED NUT way to solve your fastening problems! The TINNERMAN representative in your area will quickly supply detailed information on our FREE Fastening Analysis Service for your products. Call him soon! Meantime, write for your copy of "SPEED NUT Savings Stories", a booklet showing many typical TINNERMAN cost-saving solutions to a wide variety of fastening problems in industry. TINNERMAN PRODUCTS, INC., Dept. 12, Box 6688, Cleveland 1, Ohio. In Canada: Dominion Fasteners Ltd., Hamilton. In Great Britain: Simmonds Aerocessories, Ltd., Treforest, Wales. In France: Aerocessoires Simmonds, S. A.-7 rue Henri Barbusse, Levallois (Seine) France.



# THE WHIRLPOOL STORY

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#### **ACKNOWLEDGMENT**

The editors of *finish* desire to give thanks and credit to Whirlpool executives who assisted by furnishing background information for THE WHIRLPOOL STORY, and to plant management and key division heads and supervisors at Whirlpool for furnishing information and outlining production operations at the St. Joseph, Michigan, plants. Many others in the organization not listed here have our thanks for their willing cooperation.

Ralph Ashley, general superintendent, Plants 3 and 4
Stanley Burns, superintendent, finishing departments
Glen Farrington, welding engineer
William Fowler, assistant works manager

Pete Goodrow, general superintendent, Plants 1 and 2

George Gowan, superintendent, press departments

Leo Harman, die engineer

Dominic lammarino, superintendent, automatic fabrication

Otto Krauss, works manager

Clark Luter, paint chemist

Al Nelson, superintendent, automatic assembly

Ivan Peters, assistant master mechanic

Chet Phiscator, packaging engineer

Walt Rocks, master mechanic

Most of the photographs for this special section were completed before the 1954 models of Whirlpool laundry appliances were in production. The attractive new '54 automatic washer and dryer are reproduced on the back cover of this section.

Photos on Pages W-2 and W-8 are by Bill Montgomery, of the Whirlpool organization.

Special acknowledgment to William Fowler for his most valuable editorial cooperation.

# HISTORICAL SKETCH



1900 Model

The story of the founding, development, and growth of Whirlpool Corporation is an excellent example of the American business-success tradition. It includes all of the old-fashioned ingredients: a basic idea, perseverance, ingenuity, hard work, enthusiasm, and lack of capital—as well as the limitless opportunity of America.

The present company is the result of a merger in 1929 of Upton Machine Company, founded in 1911 in St. Joseph, Michigan, and Nineteen Hundred Washing Machine Co., founded in 1898 in Binghamton, N. Y. (The Binghamton plant was closed and its equipment moved to St. Joseph in 1939.) Until 1950, when the name was changed to Whirlpool Corporation, the merged companies were known as Nineteen Hundred Corporation.

The late Louis C. Upton founded Upton Machine Company with \$5000 working capital and six employees. He was shortly joined in the venture by his brother Fred S. Upton, who is now vice president and treasurer of Whirlpool.

By 1916, the firm had overcome the most rigorous of its birth pains, and received its first order for washing machines from Sears Roebuck & Co. Since then, the company has manufactured all home laundry appliances sold by Sears.

In the years between World War I and World War II, Nineteen Hundred Corporation grew to be an increasingly important factor in the home laundry manufacturing business, and by 1940 had become one of the top producers. Emphasis at that time was on a number of private brand lines, with the firm's own line a minor item.

Following World War II, major emphasis was placed upon the development of a strong sales organization for the Whirlpool line. Since 1949, Whirlpool home laundry appliances have become an exceedingly strong factor in the market.

The Whirlpool production story, as told on the succeeding pages, illustrates facilities which, combined with a young, dynamic management team, help explain the company's spectacular growth from an annual sales volume of \$23,000,000 in 1947 to an estimated \$150,000,000 in 1953.

Something new in conventional washers is this new Whirlpool SURGOMATIC washer. It is built with a one-piece "Rotunda" cabinet.



Ingersoll Whirlpool

. . . a steady flow of tubs for 18 years

It's a long tub line that extends from Ingersoll to Whirlpool. All the way from Chicago to St. Joseph, Michigan. Yet it's been in operation for 18 years, with Ingersoll's tub production tailored to Whirlpool's schedules.

Ingersoll is proud of this long association with Whirlpool. For this famous producer of washing machines has contributed much to washer design and efficiency.

Today, many leading makers of washers look to Ingersoll for their tub requirements. With experience that covers the whole field of tub design, with specialized equipment that assures on-schedule production, with the efficiency that means high quality at economical cost . . . Ingersoll can provide the answers to any tub problems you may have.

Consult Ingersoll—without cost or obligation.





PRODUCTS DIVISION

BORG-WARNER CORPORATION

310 S. Michigan Avenue • Chicago 4, Illinois



what would have been considered a normal figure in 1939 or 1940, we kept going at a constantly accelerating rate.

Certain factors, of course, modify the actual extent of the increase. In the first place, during these five years the sales picture has changed from a predominance of wringer washers with the automatic washer and dryer in their introductory stages, to a market in which automatics are outselling wringer washers by a wide margin, and dryers are rapidly becoming a major factor. The number of dollars the customer pays for one unit of home laundry equipment has changed radically. Before the war you could buy a good wringer washer for \$75, sometimes less. Now you buy an automatic washer for between \$200 and \$350.

We have also experienced a change in how much a dollar will buy; but that's a different "speech."

Despite these qualifying considerations, the industry is much bigger than we dreamed it ever would be before World War II. I think there are probably four factors responsible for this change:

1. As most everyone knows, we've been having a bumper crop of babies every year since World War II. We are adding to our population at the rate of about 2.7 million a year. A

# The home laundry industry—and Whirlpool

AN INTERVIEW WITH Elisha Gray II • PRESIDENT, WHIRLPOOL CORPORATION, ST. JOSEPH, MICHIGAN by Dana Chase • EDITOR OF FINISH



Question: Mr. Gray, I have been examining sales figures in the home laundry appliance field and find that your industry

went into World War II with a gross annual volume of about \$175,000,000 and emerged from the first year's production (1947) after the war with a gross of some \$665,000,000. Since then you have had a steady growth as an industry, and added about \$225,000,000 to your total for 1952. How do you explain this growth?

Answer: Like other industries, we entered 1947 with the need for filling a huge backlog of demand created during the war years. The surprising thing is that instead of filling that pent-up demand and then dropping back to

good baby crop makes a good washing machine market. Adding 2.7 million of population per year is the equivalent of adding another market like Detroit to our potential.

2. There has also been a very important social factor involved. The days when you could hire a girl to come in and do your housework for five dollars a week are gone. The

to Page W-50 ->

finish JANUARY . 1954



# Engineering . . .

some timely comments from an engineer who has spent some forty years in the home appliance industry

# AN INTERVIEW WITH P. Edward Geldhof . VICE PRESIDENT IN CHARGE OF ENGINEERING



Question: Mr. Geldhof, as an engineer, how do you explain the tremendous growth of the appliance industry and espe-

cially of the home laundry appliance industry since World War II?

Answer: The tremendous advance in technical development made during the war led us all to expect great things for the consumer market after the war. The housewife, too, anticipated her share of labor saving devices. There was a huge demand for things that would do the hard work easily, and she was willing to pay for them. The shortage of domestic help during and after the war accentuated this need. When it could be filled with devices that were pleasing to her, the result was obvious.

Question: Do you feel that the engineers in the home laundry appliance industry have met this demand in the best possible manner?

Answer: Engineering accomplishments in all fields of home appliances have more than met the anticipation first exhibited by the consumer. The housewife has been given all sorts of equipment — more than she originally expected. In our own field we have now had time enough to prove the soundness of our designs, both esthetically and functionally. The tremendous acceptance given them by the housewife has spurred us on to still greater hopes for devices that give ever better, more foolproof service.

Question: What do you think are

the greatest areas of demand on the engineers for new appliances today?

Answer: Future developments will give much greater attention to faster operation, greater compactness, and lower cost.

Despite the fact that the dryer was somewhat later in getting started, it has reached a stage of development approximately on a par with that of the automatic washer. It has been developed to this stage somewhat faster because of its greater simplicity in relation to the automatic washer. However, developmental efforts on the dryer are just as intense today as they are on the automatic washer.

Question: Mr. Geldhof, you have been in the appliance industry for some forty years. Do you have any comment to make on developments in esthetic design during this time?

Answer: The early machines were strictly functional with little regard for appearance or finish. The commercial industrial designer entered the picture in our industry in about 1932 and has made a tremendously important contribution to the development of esthetics in the field. New processes for rust proofing and finishing have also been developed. Thus, today's machines have real beauty that will be as lasting as the highly developed mechanism.

Question: What about plastic agitator in washer? Will it remain?

Answer: Right now we have many uses for plastics in our business. It is particularly suitable for agitators because it has a smooth surface and thereby is easy on clothes. It is non-

corrosive which is another advantage. And the fact that plastics by their very nature are extremly light weight makes this material perfect again for agitators which are a reciprocative part and easy on the washer mechanism. Naturally, we are continually experimenting with other materials and maybe one of these days we'll find a better one, but at present plastics do a very fine job for us.

Question: Will automatics become more fool-proof as far as service is concerned?

Answer: We are always working toward the fool-proof mechanism. It's an endless race, but our service reports are among the lowest in the industry which serves to indicate that we are making some headway. Slowly but surely I think we are overcoming the problem of users who insist on to Page W⋅50 →

P. EDUARD GELDHOF



The "heart" of an automatic washer, the transmission, is put through a complete test run in simulated load set-up. This operation is performed in a special test room in Plant 1.

# Manufacturing . . .

six points from the operations "notebook" which relate to both plant efficiencies and product qualities

by D. W. Alexander . VICE PRESIDENT IN CHARGE OF OPERATIONS



We hardly claim to be the originators of the widely used, and abused, terms, "quality" and "efficiency."
When they apply to pro-

duction at Whirlpool, however, those of us in charge of operations and production take definite pride in making these terms have a definite meaning We try to make effective use of proven innovations in production. Some of these come from outside sources, many from our own engineers and plant men. Here are a few tangible examples of what we mean.

1. Our quality control, which begins in the Purchasing Department long before we receive raw materials and parts, and only ends in the Service Department sometimes years after the finished product has left our factory, is one of the most exacting in any industry. For example, on our assembly lines operations may be stopped immediately, and often are, for any deviation from statistical quality control limits, which, incidentally, are closer than our own engineering specifications. It is impossible for any defect, major or minor, to be repeated in more than two or three conseuctive units, without detection.

2. Necessity has forced us to increase drastically the efficiency of our material handling. We have no inplant stock rooms. Lack of warehousing facilities has made it necessary for us to devise methods for moving raw materials and purchased parts immediately from the receiving

docks to fabricating and assembly

3. The use of large presses, in line, for progressive operations is not new or spectacular in the appliance industries. Neither are the methods that we have adopted to get the most efficient use from this equipment. Our time and methods men have devised a new way of loading sheet steel into these presses from roller levelling equipment that is not only labor saving but does the job required in about half the previous time.

4. We thought we had taken quite a step forward in cutting material and handling costs when we changed from crate to carton packaging a long time ago. Then we found that by combining certain standard equipment with that designed by our own people we could flap fold and case seal automaticaly. Now we are working on a plan to move more sealed cartons per hour onto freight cars by a combination of conveyors and grab-type lift trucks.

5. Occasionally a situation exists where, by careful study, we have been able to turn it into an opportunity for increasing both quality and efficiency appreciably. This was the case in our cabinet forming and welding operations. From an almost entirely manual operation we were able to change to an almost entirely automatic procedure by coordinating these two steps.

6. Much has already been said by other manufacturers in praise of the electro-coating or electrostatic spraying equipment for finishing cabinets. The fact that we can now finish 22 cabinets more thoroughly with one gallon of paint than we could previously finish eight units, speaks eloquently for the equipment.

As in all large scale manufacturing operations where quality is the manufacturing principle, and efficiency the constant aim, we are often tempted by the beguiling and seemingly innocuous opportunities that crop up from time to time to cut costs. We have learned to examine these short cuts not without enthusiasm, but with extreme care. We know there are still greater efficiencies from where our present ones have come. We also know the excessive price of a short cut that includes lowered quality as part of the cost. We aren't in the market for this kind of "bargain."

D. W. ALEXANDER



# Marketing . . .

space, time and word-of-mouth advertising are combined with clear channel communications from top management down through the marketing organization

# by John A. Hurley . VICE PRESIDENT IN CHARGE OF WHIRLPOOL SALES



The postwar growth of Whirlpool Corporation has brought it to the position of "the world's largest manufacturer of

home laundry appliances." I have been asked what part of this growth I attribute to our national marketing program.

Before we had a national marketing program here at Whirlpool, we first had to have something to market that would measure up to our standards. We belive that a marketing program, in the sense that it embraces advertising, promotion, merchandising and the like, is a means to an end, not the end itself. It has been our policy, originally laid down by the late Lou Upton, to determine first if what we have to market meets all of our quality standards. If these requirements are met then we determine how to market.

At the close of World War II we were certain, as were other manufacturers, that a ready-made market existed for home laundry appliances. What we were not certain about was how long we would exist after this ready-made market had evaporated. For this reason we were among the last of the major appliance manufacturers to come out with a post-war line. We examined and tested that new post-war baby, the automatic washing machine, from all angles. This caution and conservatism, we think, has paid off. Our careful approach is not based on altruism; it is more a measure of self preservation.

Our first automatic equipment was designed for the class rather than for the mass market. While we are not so old fashioned, or foolhardy, as to believe that the world will beat a path to our door, we do believe that a satisfied customer is the most eloquent form of advertising. We do not believe, by any means, that it is the only form. Combining the more commonplace and controlled forms of space and time advertising judiciously with the carefully and painstakingly developed factual word-ofmouth advertising is probably the major contribution that our marketing program has made to the sales growth of the company.

Our 1954 line, comprising nine different models, is typical of how our marketing program has progressed over the last six or seven years. While we again stress the class market at the top of our line we do not overlook the mass market. I think that this is best indicated by the fact that the retail price range of our 1954 line runs from \$349.95 to \$199.95.

I believe that the close inter-relationship and open lines of communication that begin at the top management level and extend through our 15 regional sales managers, our 79 distributors and through some 12,000 retail dealers, is probably the major factor in keeping Whirlpool merchandise moving. It would be over-simplification to state flatly that engineering knows all of the every day problems of sales, and that manufacturing is constantly aware of the problems of both — but it would be

pretty close to the truth! As a management team we are not only close knit but we are also far-reaching.

Our regional sales managers, who are an integral part of our team, are kept closely informed. Recently, to bring our distributor organization even more closely into the management picture, we set up a panel consisting of key distributors located strategically throughout the country. The makeup of this panel, which will be changed at regular intervals to get a true cross-section reaction and to give everyone an opportunity to participate, will be of such a nature that every phase concerning production, sales, personnel, marketing and all of the various phases of top management are very thoroughly aired.

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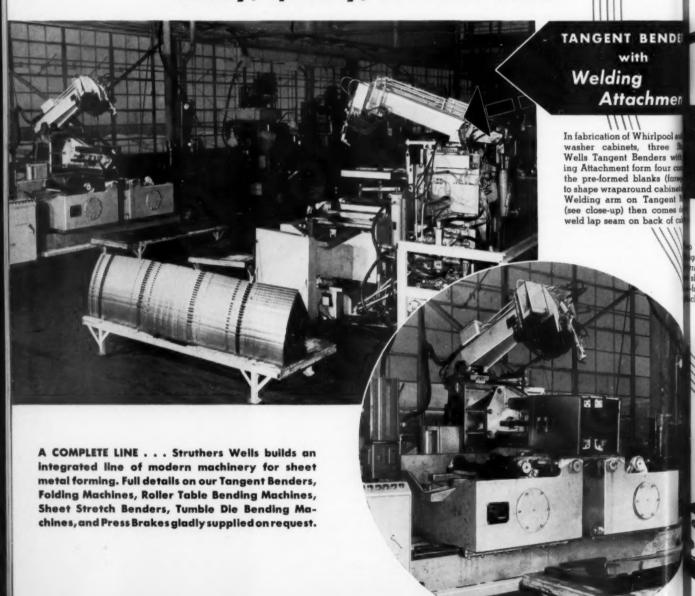
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# At the Heart of Whirlpook

# STRUTHERS WELLS TANGENT BENDERS

for complete cabinet wraparounds

—easily, quickly, at lower costs!



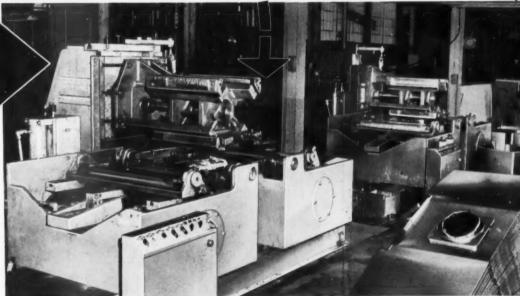
# PPLIANCE CABINET PRODUCTION...



The pace-setting Whirlpool automatic washer (left) and efficient clothes dryer.

# Quadruplex TANGENT BENDERS

Struthers Wells Quadruplex gent Benders form four corners raparound Whirlpool dryer cabishroud (see in background) from formed blanks. Dryer backs are ched by sheet metal screws.



Whirlpool Corporation's beautifully-designed washers and dryers get a big boost in the production sequence when pre-formed cabinet blanks meet batteries of Struthers Wells Tangent Benders. • In a single operation, each machine forms a one-piece cabinet wraparound with four bends and radial edge-bent flanges. On the washer, in addition, the lap seam is welded automatically—finishing the shroud at one station. • We will be glad to quote on your metal-forming needs. Write us.

truthers

STRUTHERS WELLS CORPORATION

Machinery Division TITUSVILLE, PENNA.

# Working with Whirlpool



Working with Whirlpool designers and engineers, J&L Steel helps safeguard the fine reputation of the Whirlpool line.

From J&L's mills come uniform, high quality cold rolled sheet and free-machining cold finished steels that are fabricated by Whirlpool craftsmen into glistening washers, dryers and ironers . . . home laundry equipment that combines distinctive styling and long, dependable service life.

Jones & Laughlin is proud to be a part of such achievement.

JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH

# Fabricating home laundry equipment

with principal attention to fabricating equipment and techniques employed in the production of the Whirlpool automatic washer

by William D. Fowler . ASST. WORKS MANAGER, AS TOLD TO Matt Henerly



Whirlpool automatic washers are produced in the company's main plant in St. Joseph, Michigan, with most production op-

erations performed in this one plant. Most dryer operations are performed in an adjacent plant which is connected to the washer plant by a conveyorized overpass.

In order to keep the plants operating at the peak efficiency needed in any high-volume production operation, many innovations are evident—from steel storage to packaging of the finished laundry appliances.

#### Steel storage

At the receiving end of the steel storage area, an inside throughway provides a sheltered unloading area for trucks. Alongside this truckway is a wall barrier between the truck bay and the storage area proper. This requires that received loads be lifted over this wall by one of two 52-footlong cranes with capacities of 10 tons operating in parallel bays. The wall, itself, acts as a barrier against dirt, rain and snow, and prevents cold drafts from moving across the warehouse floor.

Stacked sheet steel and all other stock throughout the operation (including purchased finished parts) is coded with 12 colors to represent the months of arrival. The material is moved on a rotation basis, first in being the first out. There is a great variety of sizes and weights of material, including sheet and coil stock,

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bundled bar stock and tubing. The sheet material runs from 10 to 24 gauge; bar stock up to  $2\frac{1}{4}$ ".

#### Press department

The press department for sheet metal is divided into three sections:
(1) heavy blanking for cabinet fabrication, automatic presses, and miscellaneous blanking, (2) heavy forming section for large component parts, multiple press continuous operation, and (3) a section of miscellaneous

and secondary operations on small component parts.

#### Blanking and automatic

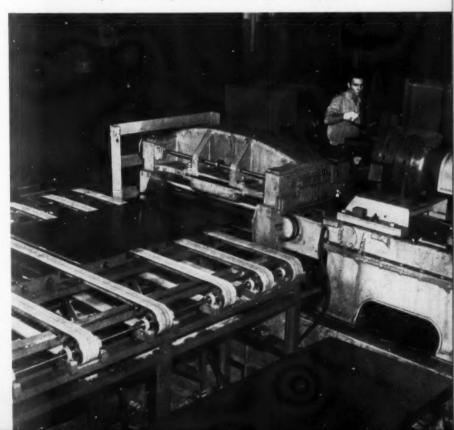
press operations

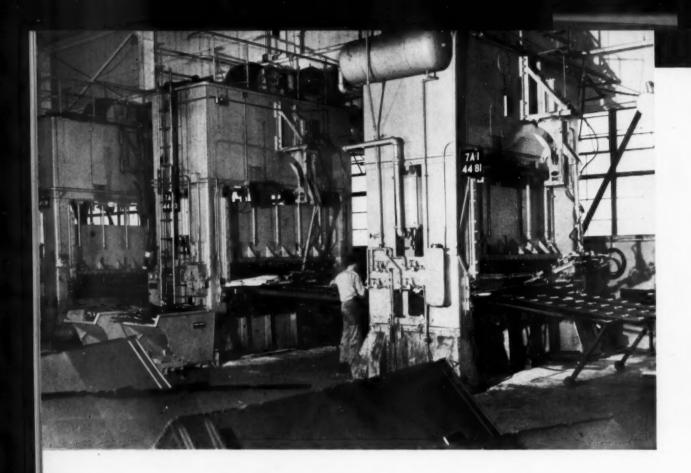
From warehouse storage, coil stock up to 12-15/16" wide is moved to an automatic press set-up where small component parts are formed in high speed operations. The six presses in

To Page W-18 →

turn page for fabrication photos

Sheets 36" x 108" are delivered by crane to a gravity conveyor which feeds this process roller-leveller. Operator in photo is feeding the leveller which in turn delivers the sheet to the multiple-belt transfer unit at left. The transfer unit automatically feeds a gravity roller conveyor which delivers the sheet to the first press in the sequence shown on the following page.







Above: Roller-levelling of sheet stock for the wrap-around cabinet body for an automatic washer is followed in continuous progression by embossing, blanking and piercing, and flanging operations in this series of 300-ton mechanical double-crank presses. Between operations, the sheet is handled on roller conveyors, with mechanical hands used to unload the presses.

Left: The pre-formed cabinet sheets are stacked on these special pallets, and then transported by lift truck to the tangent bending and welding line where the cabinet assembly is completed.



Above: A pre-formed cabinet sheet is being placed in a combination tangent bender and welding machine which automatically folds the four corners of the cabinet "shroud" to shape, and welds it along the back near one corner, the full length of the cabinet.

Right: Following the bender-welder operation, the toe plate is welded to the cabinet as the first operation in a 3-welding machine sequence. This is done by a tangent bender operator while the bender cycle is in operation.



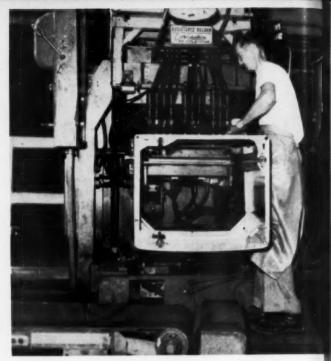
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or the omatic ression flang-echanations, with resses.

stacked rted by welding pleted.



After the toe plate is welded to the cabinet in the first welding machine, the top welds of vertical reinforcements and top gussets are accomplished, with some 45 spot welds in rapid sequence.



Final step in completing the cabinet assembly for an automative washer is welding a channel bar at the bottom and a stiffer bar across the middle of the cabinet back.

this set-up range from 35 to 150 tons, with automatic de-coiling and feeding attachments. Altogether, some 130 small parts are made in this area, including some parts for clothes drivers.

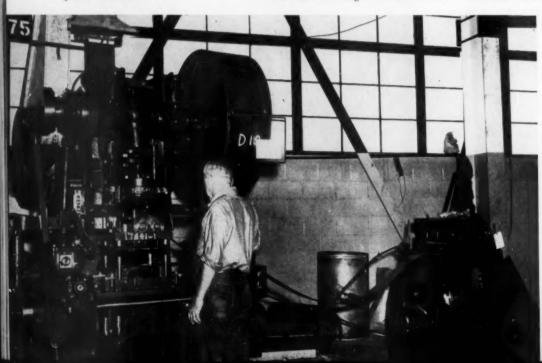
Following shear and slitter operations, sheet stock for other component parts is blanked in another set-up consisting of a row of 14 presses, ranging from 60 to 150 tons. Following further press operations in another area, these parts are taken directly to the sub-assembly and prime coat lines.

#### **Cabinet fabrication**

Sheet stock for the wrap-around cabinet body is first roller-levelled, followed in continuous progression by embossing, blanking and piercing, and flanging operations in a series of three 300-ton mechanical double crank presses. Between operations, the sheet is handled on roller conveyors, with mechanical hands used to unload the presses. Both 24" and 29" cabinet bodies are made on this line.

Next, the preformed sheet is taken to a line consisting of a combination tangent bender and welder, followed by three resistance welding machines which automatically weld the toe plate, brackets, etc., to the cabinet. (Two automatic lines and one manually operated are currently in production.)

In the first operation, the benderwelder folds the cabinet shroud to shape and welds it along the back near one corner, the full length of the cabinet. Next, the toe plate is welded to the cabinet, after which a welding operation adds the top gussets and vertical stiffeners, with the



One of six set-ups for starting small component pattern coil stock. Automatic coiler on right lubricates stock with drawing compour Roll moves stock through the station progressive Skeleton scrap is then chop to size for electric furnibushelings.

JANUARY . 1954 finish

final welding operation adding the suspension assembly braces.

The wrap-around cabinet assembly is then polished with flexible shaft metal finishing units. Following inspection, the cabinet is hung on one of two different conveyors — one feeding the paint department; the other going into bank storage between fabrication and prime painting.

#### Fabrication of major components

At right angle and across the aisle from the cabinet forming area are three nearly-identical press set-ups where the washer lids, toe plates, brackets, braces, dryer doors, fan housings, and other components are formed.

autom

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A typical set-up is used in the forming of aluminum lids. In the first operation, the flanges are drawn along with the indentation for the medallion-handle in a 300-ton hydraulic press. Next, in a trimmer, the drawn flange is cut to shape in four rapid horizontal thrusts against shear blocks. Six holes for the medallion are punched in a 175-ton press. The pieces then pass by belt conveyor to a second 175-ton press, which flanges three sides into a return. The same conveyor moves the lid to a 105-ton press, which pierces and embosses four hinge holes. Any intermediate metal finishing is done in the same sequence by moving skidded polishing jacks alongside the conveyor.

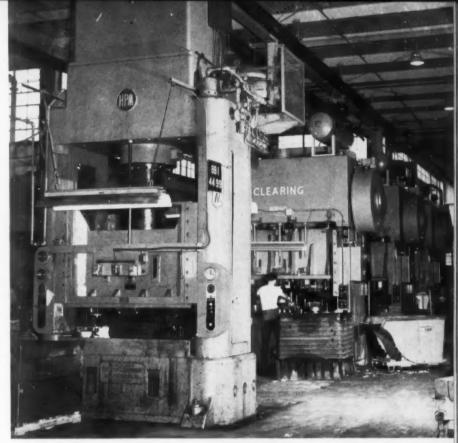
#### Base plate fabrication

The first operation in base plate fabrication is the addition of a reinforcing hub, which is spotwelded around the flange to the base plate. It passes on to another operation where spot welding in four positions seals the top edges of the hub to the center of opening in the base plate.

Next is the addition of three studs to support the gear housing. This is done by inserting headed studs through holes in the base plate, and projection welding the heads to the base plate. Then are added two studs which will serve as pump supports. The base plate unit is then degreased and flow coated with a gray primer, and returned for further fabrication.

Precision boring machines next

finish JANUARY . 1954



One of three similar press lines for the fabrication of washer lids, dryer doors, toe plates, brackets, braces, and other components.

bore and face the base and flange assembly, after which a tube is press fitted into the hole in the hub, the base plate unit placed in a jig having an optical aligning unit within it, and the studs aligned by use of a straightening tool. All stud heights are then cut to a uniform plane by a

common facing operation in a milling machine.

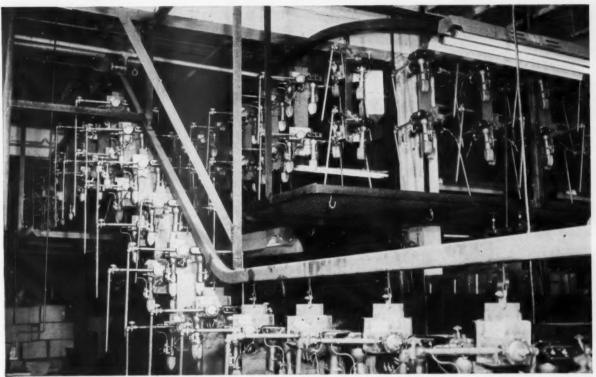
The tube is then gauged by alignment, so there will be no side thrust or rubbing of the drive tube that delivers the power to the extractor basket nor the inner drive shaft which operates the agitator.

In this trimming machine, the drawn flange for aluminum doors is cut to shape in four rapid horizontal thrusts against shear blocks.





# Costs go down when production goes UP!



Part of the 450-ft. "ZIG-ZAG" conveyor in WHIRLPOOL'S gas burner assembly area. Upper level of conveyor serves as "moving storage" to eliminate in-and-out storage handling.

# Richards-Wilcox Zig-Zag"Continuous Power Conveyors

Keeping pace with competition means keeping costs as low as possible. That's why more and more industries, like Whirlpool Corporation, St. Joseph, Michigan, are turning to R-W "ZIG-ZAG" Conveyors. "ZIG-ZAG" helps reach new highs in operating efficiency, new lows in production costs—puts unused overhead space to work—reduces time and effort in materials handling.

For these and many other reasons R-W Continuous Power Conveyors will help you lower costs to meet the stiffest competition. Why not arrange right now for a Richard-Wilcox conveyor engineer to consult with you? There's no charge or obligation.



1,000-ft. assembly pallet return conveyor in WHIRLPOOL CORP. plant. Note "ZIG-ZAG'S" extreme flexibility.

1880



1954

SUDING DOOR HANGERS & TRACK • FIRE DOORS & FIXTURES • GARAGE DOORS & EQUIPMENT • INDUSTRIAL CONVEYORS & CRANES • SCHOOL WARD ROBES & PARTITIONS • ELEVATOR DOOR OPERATING EQUIPMENT

Richards-Wilcox Mfg. Co.

HATEBIAIS HANDLING DIVISION

436 W. THIRD STREET, AURORA, ILLINOIS

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W-21



# New NU-PONS Provide Superior Alkali, Corrosion and Moisture Resistance!

Remarkable resistance qualities. Superior durability. Excellent adhesion to various metals. These are the extras which have made NU-PON Primers and Enamels production favorites on the finishing lines of America's leading appliance and home laundry manufacturers.

NU-PON Primers are used wherever metal protection is required, and permit economies because NU-PON Primers can be flow coated, dipped or sprayed in film-thicknesses as low as 0.0003". NU-PON

Enamels provide one-coat or top-coat beauty, plus maximum chemical and corrosion resistance. Use NU-PONS together for lasting product beauty and production savings.



#### WHIRLPOOL SAVES WITH NU-PON

Whirlpool Corporation, manufacturers of a famous line of home laundry equipment, uses NU-PON on their washers and ironers.

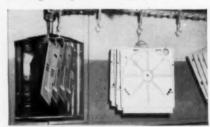
#### THE GLIDDEN COMPANY

INDUSTRIAL FINISHES DIVISION
11005 MADISON AVENUE • CLEVELAND 2, OHIO

SALES OFFICES AND FACTORIES: San Francisco, Los Angoles, Chicago (Nubian Division—1855 North Loclaire Ave.),
Minacapalis, New Orleans, St. Louis, Cleveland, Reading, Atlanta, and Toronto.



These panels were exposed to a 400-hour salt spray test together. The panel at the left, coated with a thin film of NU-PON Primer has not eroded while the modified alkyd film on the panel at the right has pitted and flaked off.



The excellent stability of NU-PON Primers makes it an ideal flow coating material. It can be collected and circulated again and again without deterioration.

# The finishing story

a description of material quality control methods, production equipment and processing routine for finishes

# by Stanley Burn's . SUPT. OF FINISHING OPERATIONS, AND Clark Luter . PAINT CHEMIST, AS TOLD TO John McLaughlin



The story of the attractive and durable paint surfaces of the Whirlpool appliances falls naturally into two divisions. The

more obvious one is the application of the paint to the products. Another, but less apparent activity, is the equally important establishment of specifications and testing of production shipments of paint to insure the uniformly high results desired.

#### The laboratory paves the way

Before any paint is used in production, the laboratory acquaints itself with all of the properties of each particular batch, and assures itself that the material will function satisfactorily by the application of a series of tests conducted in the laboratory, following rigidly established test procedures. The writing of intelligent specifications is the serious concern of the chemical laboratory. Here, each desired property of a paint is evaluated by a testing procedure. Acceptance or rejection of each batch is based upon the grading of these tests. In every case the paint must be above the minimum specification to warrant acceptance.

The chemical laboratory continuously searches for test procedures which will accurately predict the life and behavior of the paint when in service. Such procedures, in addition to predicting accurately, must be of such practical nature as to be easily adaptable by the paint suppliers. The intention of the organization is to help the suppliers produce

and improve the product, as well as to insure that the current production is up to standard.

One interesting facet of this elaborate protective system is the specification that requires that a production sample of each batch precede the arrival of the batch proper, and be delivered to the laboratory. This sample must be accompanied by such information as the production run number, cryptometer value, per cent

of total solids, weight per gallon, specific gravity, and viscosity. The laboratory applies this paint to test panels following a rigid routine to insure uniform spray procedures, film thickness, and time and temperature of curing.

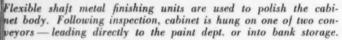
In the case of primers, these test panels are checked for adhesion, hardness, and elasticity. The cover coats are checked for these same properties, but in addition are tested

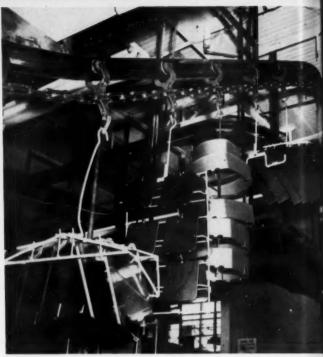
Inspection of painted parts in area from which the assembly line is fed.



finish JANUARY . 1954







Nearly 25 miles of conveyors are used throughout the Whirlip plants in St. Joseph, Michigan. This conveyor carries compon parts from fabrication dept. to paint dept. on the second for

for color match. The laboratory uses a color and color difference meter to verify that the color falls within the specified range permitted. The paint is also tested for resistance to immersion in soap and detergent solutions.

The laboratory also specifies the operating controls and checks upon these. The viscosity of the primer is checked every 30 milinutes with a No. 4 Ford cup and held within a

range of plus or minus one-half second in flow time.

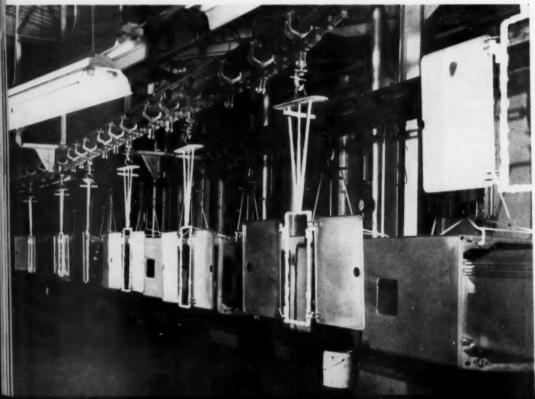
#### Automatic paint application

One large finishing room in the automatic washer plant encompasses the four major operations in applying finish to the appliances. The impression of the visitor to this area is one of seeing and yet not seeing.

The cleaning is accomplished in an

automatic spray cleaning and phosphatizing unit, while the ware is still on the conveyor which delivers it to finish from metal finishing department. The fabricated parts enter by two parallel conveyors into the seven-stage continuous cleaner and phosphatizing unit.

All parts are then dried at 325° F. for 20 minutes in a continuous gas-fired oven.



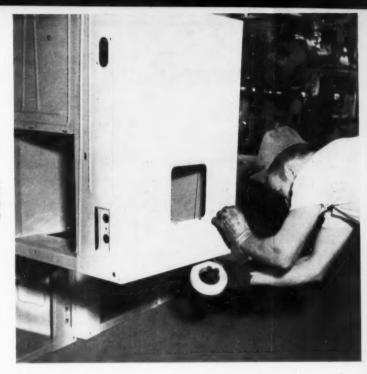
Two conveyor lines paralleling phosphatizing unit. Both can sanded, prime coated parts final paint booths, with two rag wipe-off just ahead of fin spray.

JANUARY . 1954 finish

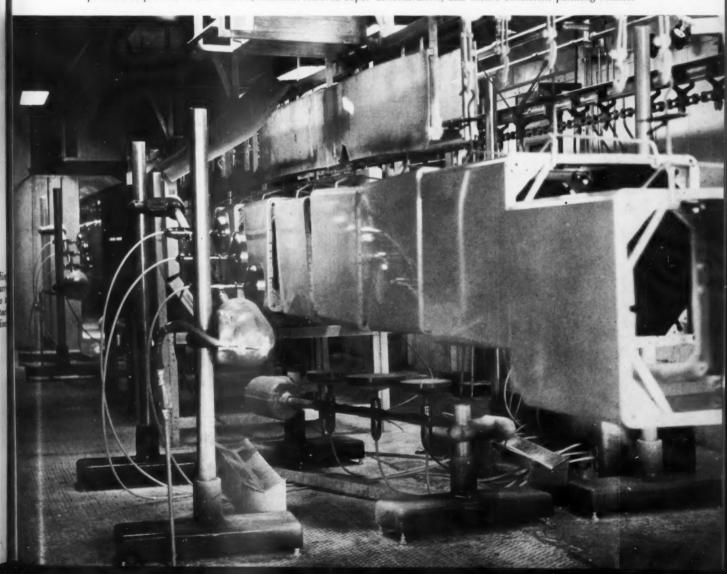
#### Flow coating, electrostatic spraying

The ware continues on a conveyor and goes into an automatic flow coating tunnel, to emerge coated. A look into the flow coating chamber reveals a series of flow nozzles, and mist into which the pieces disappear. Within the flow coating tunnel, prime coat is flowed through nozzles at 3-5 psi onto the piece and permitted to drain for several minutes in solvent laden chambers. Parts are then allowed at least five more minutes in open atmosphere before entering the bake oven, where they are cured at 375° F. for 20 minutes.

The conveyor continues through the finishing room, where the parts are removed from the line, individually sanded, and, when approved by to Page W-48 → Taping ends, prior to masked spraying of black paint to the "kick" plate.

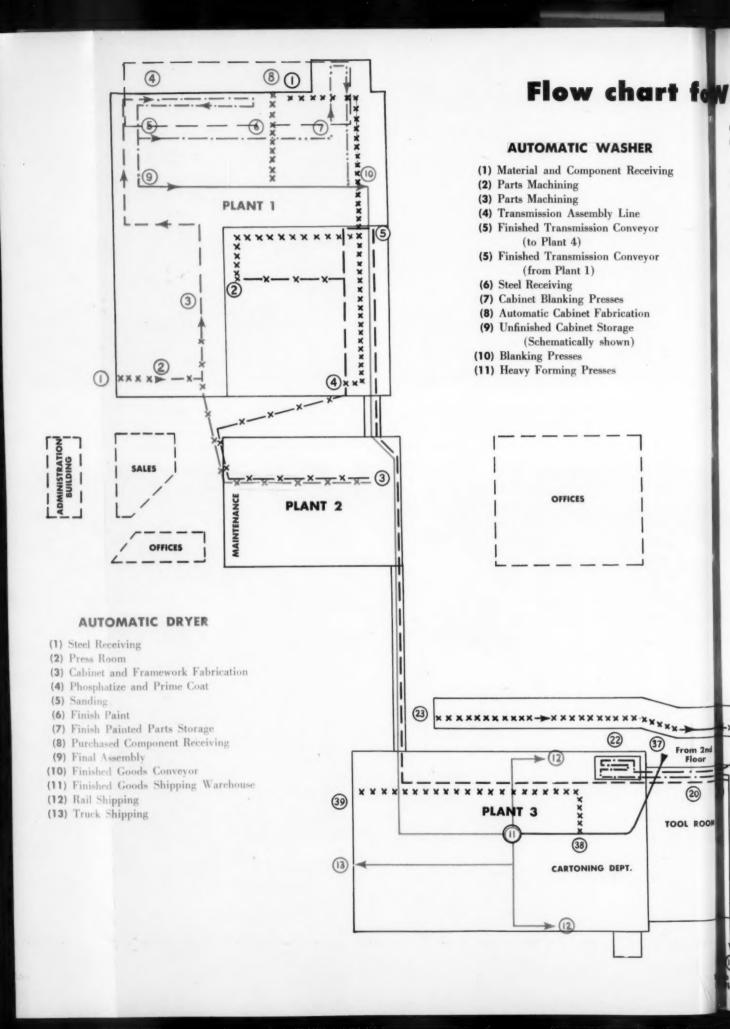


Applying organic finish electrostatically to "sets" of washer cabinets. The first battery of electrostatic units is followed by a rod-type radiant dryer, which partially "sets up" the finish. A second battery of similar units applies additional paint to the desired thickness. This finishing room is maintained at 75° F, and kept under positive pressure to prevent contamination, maintain lowered vapor concentration, and insure consistent painting results.



Whirlps composit ond flo

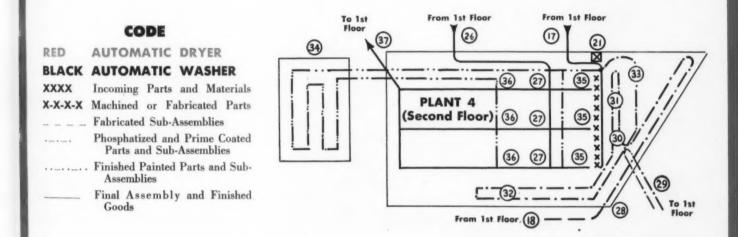
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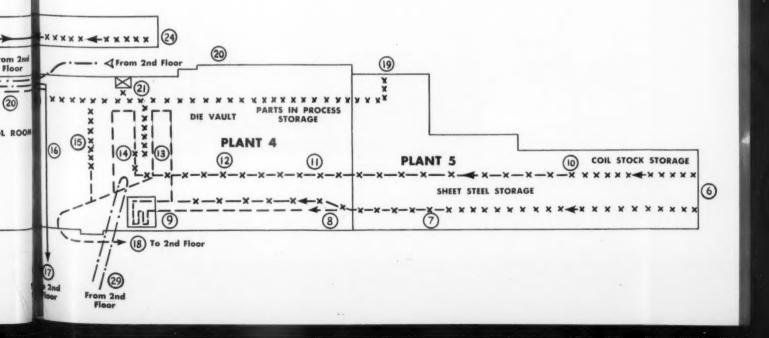


### fowhirlpool plants in St. Joseph, Michigan

- (12) Secondary and Light Presses
- (13) Manual Cabinet Fabrication (Supplementary to 8)
- (14) Top Fabrication
- (15) Base Plate Fabrication
- (16) Base Plate Assembly
- (17) Base Plate Assembly Conveyor
- (18) Conveyors to Metal Preparation
- (19) Purchased Component Receiving
- (20) Small Parts to and from Prime Coat
- (21) Elevator (1st to 2nd floor) for Small Purchased Components
- (22) Prime Coated Base Plate Storage (Schematically shown)
- (23) Porcelain Top, Ring and Agitator Receiving
- (24) Porcelain Tub and Basket Receiving
- (25) Tub and Basket Assembly Line
- (26) Tub and Basket Assembly Conveyor

- (27) Tub and Basket Assembly Supply to Lines
- (28) Phosphatizing Unit (Ovens on Roof)
- (29) Transfer Station to Welding Department Conveyor
- (30) Transfer Station for Double Prime Coat
- (31) Prime Coat Unit (Ovens on Roof)
- (32) Sanding Area
- (33) Finish Paint Booths (Ovens on Roof)
- (34) Finish Painted Parts Storage (Schematically shown)
- (35) Assembly Lines
- (36) Finished Painted Parts from Storage
- (37) Finished Goods Conveyor to Packaging
- (38) Packaging Department
- (39) Packaging Material Receiving
- (11) Finished Goods Warehouse
- (12) Rail Shipping
- (13) Truck Shipping





Clyde, Ohio

Clyde Porcelain Steel Division Clyde, Ohio

MAIN OFFICES AND PLANTS WHIRLPOOL CORPORATION ST. JOSEPH, MICHIGAN



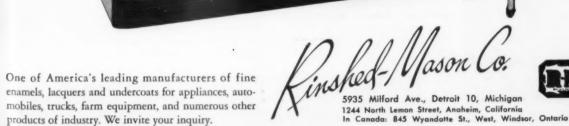
La Porte Aircraft Division La Porte, Indiana Whirlpool AUTOMATIC WASHER

the finish:

RINSHED-MASON

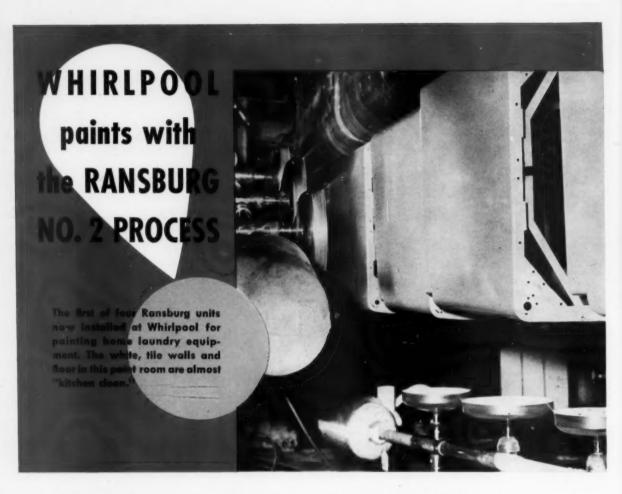
WHITE BAKING ENAMEL

Rinshed-Mason enamels.



finish JANUARY . 1954

W-29



■ When Whirlpool Corporation switched from hand spray to the Ransburg No. 2 Process, paint mileage jumped approximately from 8 washer cabinets to TWENTY-TWO cabinets per gallon of paint. Whirlpool, too, was the first to employ the Ransburg "grouping" conveyor, especially suitable for use on washer or refrigerator lines.

Along with this spectacular paint saving, Whirlpool reports a more uniform, higher quality finish on their home laundry products. The number of repaint jobs was cut from 40% to less than 10%, and less than 1% of these are due to defective paint application.

Other economies are being achieved. The former 60-ft. water-washed, down-draft, hand spray booth was taken out, cutting maintenance, make-up air, and

heat loss substantially. Since there is no overspray paint to be exhausted with the No. 2 Process, ventilation is needed only for solvent vapor, and make-up air was reduced accordingly.

Appreciating the many advantages achieved on this cabinet line, Whirlpool put three more No. 2 Process Units to work, one on their dryer line . . . one on a miscellaneous parts line . . . and one on their wringer washer line in the Clyde, Ohio, plant.

The Whirlpool story is another typical example of greater efficiency, increased production—at less cost—with the Ransburg No. 2 Electrostatic Spray Process.

Write for our brochure describing the No. 2 Process in detail. Or, ask for our sound and color movie which shows numerous on-the-job examples of the No. 2 Process at work in plants all over the country.

Kansburg ELECTRO-COATING CORP.

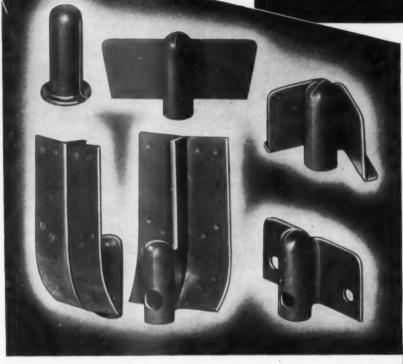
Indianapolis 7, Indiana

RANSBURG

Danielson
your stamping headquarters
for PRECISION

WASH MACHINE
PARTS....

Two of the various types and styles of pulleys produced by Danielson. For production economies, Danielson stamped, seet welded pulleys can't be beet.



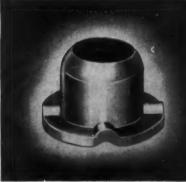
### AND BRACKETS ...OUR SPECIALTY...

Here are a few of the types of caster sockets and brackets manufactured by Danielson. All are produced with extreme economy to exact specifications. Let us figure on your needs.

Our plant is specially geared for this type of work where high production and low cost are a prime factor . . . . and yet quality and precision workmanship are always our goal.

Our Press Department is equipped with presses ranging from 5 ton to 300 ton capacity, and specializing in deep draw work for Appliance and other Metal Products Manufacturers. Other services include: Shearing — Circle Shear — Spot Welding — Arc Welding — Silver Soldering — Hydrogen Brazing — Polishing — Degreasing — Painting — Assembly — and our complete Tool and Die Department will furnish precision tooling for your own fabricating department.





Danielson stamped WELD NUTS for use on automatic washing machines, dryers, refrigerators and other similar products requiring leveling at point of installation.

Danielson WELD NUTS made in a multi-

Danielson WELD NUTS made in a multisequence stamping process are equal in durability and strength to any machined weld nut but cost less.

# MPC is proud to wear it!



WE have enjoyed the privilege of doing business with Whirlpool Corporation for 15 years. During this period MPC compression and injection molded plastic parts have met faithfully the high quality standards established by Whirlpool for its world-famous home laundry equipment.

### MODERN PLASTICS CORPORATION

BENTON HARBOR, MICHIGAN





### **Assembly and safe shipping**

sub and final assembly, materials handling and packaging and shipping



h

The fabrication of the base plate for an automatic washer is followed by the sub-assembly of the transmission. First

the completed base plate is placed on a waist-high, double-chain conveyor, and as it moves down the line, the gear case, linkages, pumps, motor and wiring harness are added. While still on this line, the assembled transmission is given a functional test for high wattage and tight bearings. This sub-assembly is then placed on a monorail conveyor feeding the main assembly department on the second floor.

Final assembly operations are performed on three similar chain conveyors, followed by waist-high slat conveyor lines which permit assembly from both sides of the line. Across the head of each line is the overhead conveyor carrying the base plate with assembled transmission. While still on the conveyor, three suspension rods with shock-absorbing rubber balls are added to the base plate.

The first step in final assembly is placing a tubular building pallet on

to Page W-38 ->

finish JANUARY . 1954



Du-Wel Metal Products, Inc. is extremely proud to be a regular supplier of components to the Whirlpool Corp. Du-Wel Metal Products, Inc. has been steadily growing and recently finished its sixth expansion in the last eight years by the addition of 12,000 feet of ultra modern manufacturing facility. This growth, of which we are justly proud, closely parallels the outstanding expansion of the Whirlpool Organization. With continued good service and quality in products with endurance, this growth is only the beginning. Du-Wel "custom made" zinc and aluminum die castings and other production services can be a great help to any manufacturing organization.



WEL METAL PRODUCTS, INC.

## TO Whirlpool QUALITY



Just three little electromagnetic controls. Yet one is the nerve center of the Whirlpool . . . the others are equally responsible workhorses. Each must serve for life at hard labor, under extremes of heat and humidity. So specifications are exacting and inspection is rigorous. For







five years, Frost engineering has maintained (and occasionally improved upon) these standards . . . while Frost production assures deliveries right on the nose.

L. H. FROST and Company, Inc.

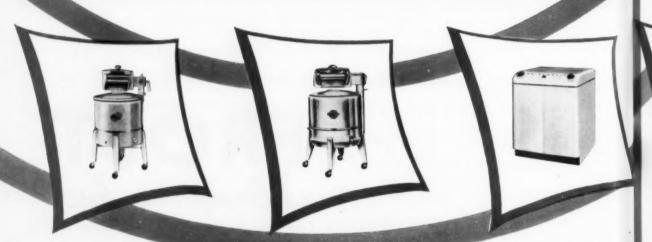
ELECTRICAL ENGINEERS and MANUFACTURERS GRAND RAPIDS 8, MICHIGAN

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For over 50 years manufacturers of

### ... THE WORLD'S FINEST



We are proud to work with the Whirlpod

NPC

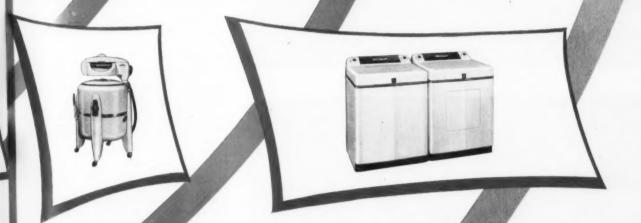
NEW PRODUCT\$

DEPENDABLE SUPPLIERS OF ALUMINUM

INPC

Longstanding Supplier of Die Castings for

HOME LAUNDRY EQUIPMENT



porporation in serving the families of the world

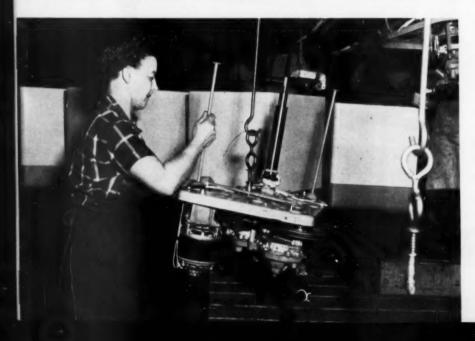
TORPORATION

BENTON HARBOR, MICHIGAN

AGNESIUM DIE CASTINGS TO AMERICA'S LEADING INDUSTRIES







Left: Sub-assembly line for attaching motor, gear case, hose to base plate.

→ from Page W-33

a short feeder roller-conveyor which carries the pallet and painted cabinet shell to the head of the main assembly line. (Cabinet shells are delivered to the assembly lines by overhead conveyors which dip down near the heads of the assembly lines, while the pallets are returned from the packaging department by a zigzag conveyor which feeds the assembly lines.)

After the cabinet is moved over to the final assembly line, the base plate and transmission is transferred by chain hoist from the overhead conveyor, lowered into the cabinet shell, and bolted in position.

As the cabinet moves down the assembly line, the timer is added, followed by other component parts, including the porcelain tub and perforated basket, top ring, valves, etc. The porcelain parts (manufactured at Whirlpool's Clyde Porcelain Steel Division, Clyde, Ohio) are delivered by a cross-feed conveyor serving all three assembly lines. Plastic units, such as floats and controls, dials and gauges, are sub-assembled parallel to the final assembly area, and are delivered to the line in containers specially-designed to protect the parts.

Whirlpool makes much use of electric and pneumatic tools in assembly operations up and down the long assembly lines.

The assembled unit, minus the top, is given a water test, then goes through a complete functional test in a sound-deadened room which straddles the assembly conveyor.

Center: Close-up view showing attaching the motor to the base plate. Note feed chutes of motor, bracket and pulley sub-assemblies.

Left: Before transmission sub-assembly is transferred by lift hoist to head of main assembly line, suspension rods with shock-absorbing rubber balls are attached to the base plate.

finish JANUARY . 1954

Right: Cabinet assemblies moving to head of main assembly line (background).

Each machine is tested in each phase of its cycle, and clutch and drive functioning is checked. A heavy solid rubber ring, which clears the agitator, is placed in the basket to simulate the resistance or drag of normal load. After passing through the test room, the tops, name plates and dials are added, and the machine is visually inspected before being placed on an open C-type monorail conveyor leading down to the packaging area on the main floor.

#### Packing starts with final assembly

The casual observer probably would not notice that the first operation in the packaging of an automatic washer begins in the second floor assembly department with the insertion of creped wadding in the corners between the washer cabinet and the top assembly. Pressure-sensitive tape holds this cushioning material firmly in place. Considerable flexibility in distributing such packaging operations is used to equalize the incentive work load between operators.

Resting on a tubular steel pallet, which has carried the washer through final assembly operations, the unit is then carried by conveyor down to the packaging department. At the first station, the washer, on its pallet, is slid from the conveyor's steel platform hanger onto a roller conveyor. The metal serial tag is affixed to the back of the washer, and the shipping tag taped to the top. An instruction sheet is dropped into the washer, and creped wadding is placed between the to Page W-46

Center: Looking down one of three main assembly lines. Here the timers, tubs, spin baskets, agitators and other components are added to the washer.

Right: Close-up view on assembly line, showing man on right attaching timer, second man completing timer assembly, and third man installing tub.

finish JANUARY . 1954

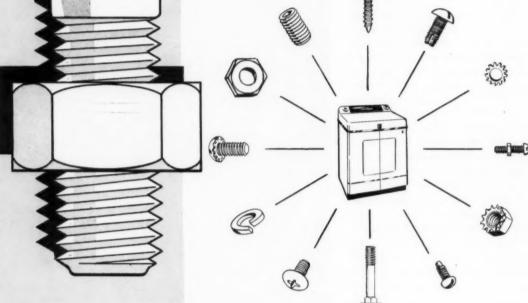








stocks of fasteners in the country. All types of screws—nuts—bolts—washers—cotter pins.



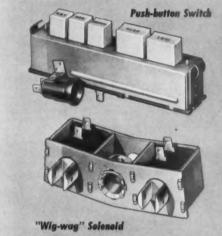
UNIVERSAL SCREW CO.

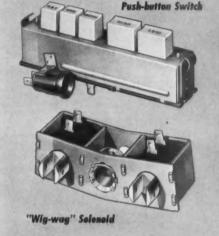
127 S. GREEN ST. CHICAGO 7, ILLINOIS SEELEY 8-3383 Universal offers a single, dependable source for all types of fasteners. Yes, a complete inventory of all types of fasteners as well as facilities to quickly manufacture items made to order. Let us show you that we can furnish QUALITY MATERIAL and the FINEST SERVICE available at COMPETITIVE PRICES.

Specialists in fasteners for the appliance industry.

SALES OFFICES • • • MILWAUKEE, WISCONSIN
704 East Pleasant Street

CLEVELAND, OHIO 6007 Euclid Avenue Express 1-8181 ST. PAUL, MINNESOTA 2639 University Avenue we're proud to be a part or should we say parts















#12130 Solenoid



Single Float Switch

Typical examples of Soreng electrical components manufactured by the thousands for Whirlpool products.



PRODUCTS CORPORATION

9559 Soreng Avenue, Schiller Park, Illinois • . Plants: Schiller Park, Illinois •

Spring Valley, Illinois

Fremont, Ohio

finish JANUARY . 1934

W-41

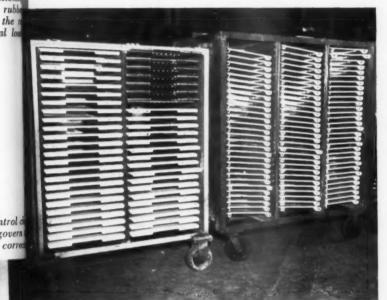


After the assembled unit is give a water test, it goes through a complete functional test in this sound deadened room which straddles the assembly conveyor. Each machin is tested in each phase of its cycle and clutch and drive functional is checked. A heavy solid rubbering is used to simulate the a sistance or drag of normal loss

After passing through the test room, the tops, name plates and dials are added. Note the statistical quality control of in background. Each assembly line has two such boards, one each on front and back lines. Control limits governoperation of the line. When defects exceed control limits, the line is stopped until cause of defects is correct







Whirlpool automatic washers near the end of the long assembly line. After final assembly operations, each machine is visually inspected before being placed on an open C-type monorail conveyor leading down to the packaging area on the main floor.

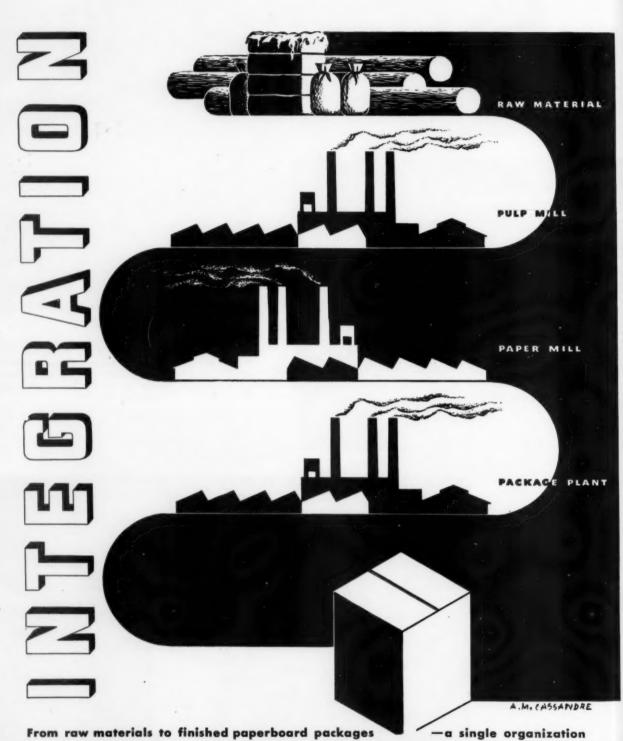
Special handling racks (felt lined to protect the finish) are used to transport lids to the main assembly lines from the sub-assembly areas. Similar racks are also used to bring the washer tops to the final assembly area.

n this packaging conveyor photo, he assembly pallet has dropped ree, and washer edge prepares to ontact and pull out solid fibre heet from between conveyor rollers. This sheet serves as a pad and rovides added protection for the bottom of the washer.

a com sound lles the rachin



finish JANUARY . 1954



CONTAINER CORPORATION OF AMERICA

W-44

JANUARY . 1954 finish

### WHIRLPOOL CORP.

Nationally Famous Manufacturer of First Line Washing Machines

### **USES**

### ARNO TAPES

### **√ARNO Cloth Backed Tape**

for holding lids in place...for ARNO Tapes have added strength... are easy to use... and will not leave any disfiguring stains.

### **V** ARNO Paper Backed Tape

over rubber gear pumps...for positive guaranteed protection in spraying operation.



### GET THE ARNO STORY

- WE CAN MEET ANY TAPE REQUIREMENTS
  - WE MAKE GOVERNMENT SPECIFICATION TAPES
    - WE SPECIALIZE IN PRESSURE SENSITIVE TAPES
      - WE MAKE NON-STAINING TAPES

### WRITE FOR CATALOG

Refer your taping problems to ARNO...our engineers and tape specialists can help you solve all tape difficulties...recommend tapes to meet your needs. No charge or obligation, of course.

ARNO ADHESIVE TAPES, INC. - MICHIGAN CITY, IND.

finish JANUARY . 1954

W-45



Multi-wall corner pads, with creped cellulose facing, are inserted the full length of the pack in the four corners. Next the top pack is placed over the unit to supplement the corner packs. The four corner "posts" hold the appliance rigidly in place laterally, with the creped facing providing protection for the washer's corner surfaces. In addition, the posts provide vertical rigidity and stacking strength.

→ from Page W-39

lid and the top. The lid is then taped.

Just before the appliances reaches the packing station, it passes over an area on the roller conveyor where a specially-built section with short rolls permits the pallet to drop free. The pallet is hung on a conveyor and taken back upstairs to the head of the assembly lines.

After the pallet drops free, the washer edge then contacts a fiber sheet, inserted in a slot between the conveyor rollers. As the washer moves down the line, it pulls the sheet out of the slot and under the unit. This sheet serves as a pad and provides added protection for the bottom of the washer which now passes onto a power conveyor belt.

Here the shipping tag is taken from the top of the washer and is stapled to the corrugated carton which is then dropped over the unit. Multiwall corner pads, with creped cellulose facing, are then inserted the full length of the pack in the four corners, providing 3/4" clearance between the sides of the appliance and the carton. Next the top pack is placed over the unit to supplement the corner packs.

As the cartoned washer moves down the line, it is shunted to either of two case sealing lines, with the sealing operation taking three minutes, and is accomplished as the packaged washer moves toward the exit end of the machine.

The completely packaged washers are then conveyed to the shipping room where they are either loaded directly into boxcars (located on two railroad spurs within the building), or stacked four high in warehouse.

Packaged washers entering one of two sealer lines. Sealing of top and bottom container flaps takes three minutes.



### 300 Air Cushions\*

INSURE THE SAFE DELIVERY OF WHIRLPOOL DRYERS



AMERICAN BOX BOARD COMPANY
designed this carton especially for
Whirlpool Dryers with double walls of
shock-resisting corrugated board. Combining
exceptional strength and "cushioned"
protection with light weight, it assures safe
delivery over hundreds of miles at economical cost.



AMERICAN BOX BOARD COMPANY

GRAND RAPIDS . DETROIT . FILER CITY . CHICAGO

finish JANUARY . 1954

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W-47

### The finishing story

→ from Page W-25

inspection, hung on the conveyor going to the enamel spray booths.

Just before the parts go into the spray booth they are cleaned with a tack rag to remove any dust particles or loose material that may be adhering to them.

Within the spray booth proper are two areas — one for hand spraying, and one for automatic spraying. In the first, there are a variable number of spray painters, depending upon the type of ware being run. Parts with "flat" contours and a single face require little or no hand spraying. Hand spraying is applied only to those parts which can not be easily and successfully covered by the automatic process.

The ware proceeds along the conveyor into the automatic painting area where the first of a series of unusual operations occur. The room is maintained at 75° F. and kept under positive pressure to prevent contamination, maintain lowered vapor concentration, and insure con-

sistent painting results. The first step in this area is the closing of open spaces between units through the use of a bunching conveyor which automatically removes the ware from the conveyor hook which has brought it to this point and advances it by means of a spiral drum guide to close proximity to the piece preceding it. This reduces the interval between units from approximately two feet to about six inches. The ware then passes in front of a series of electrostatic triple-head units which atomize and deliver the atomized particles to the ware without air pressure. Atomization is effected by the principle wherein revolving cones act as the feeding mechanism and move the fluid enamel from the hoses to the lip of the rim of the cone. Atomized fluid is deposited on the ware by electrostatic force. A battery of these units is followed by a rod-type radiant dryer, which partially "sets up" the finish. A second battery of similar atomizing units applies additional paint to the desired thickness of .0013-18 total for finish.

The ware continues along the con-

veyor into a bake oven, operating at 325° F. for 20 minutes. It rides a continuous serpentine conveyor through the ovens and continues to the area from which the assembly line is fed. Here the parts are inspected and, if approved, transferred to the mobile storage conveyor. If they are defective in any way, they are returned to the sanding area for repair and recoating.

#### Paint mixing rooms

Paint arrives at the plant in 55 gallon drums from vendors, and is stored at room temperature in the mixing room. Here the physical characteristics of the paint are adjusted to specification by the addition of solvents. As needed, fullbody enamel is dumped into mixing tanks and thoroughly mixed with the requisite amount of thinner by revolving paddle wheels. Centrifugal pumps pass the paint through micron filters in the pipes to a second mixing tank located just outside the room where the paint is to be applied. From here the paint is pumped into electrostatic units.

Clyde Porcelain Steel
Division—of Whirlpool
produces porcelain parts
for automatic washers and
dryers. Photo on right
shows the processing of
tops for dryers through a
spray booth at the plant
in Clyde, Ohio. Whirlpool
conventional washers and
ironers are also produced
at Clyde.





# A Quarter Century's Tradition of Exacting Craftmanship

In reviewing our 25-year activities devoted to engineering and producing major stampings and dies . . . for leading makers of Home Laundry Equipment and other durable products . . . most gratifying are the unfailing confidence of our customers . . . and the steady increase in the number of manufacturers we are privileged to serve.

For the coming years we pledge unremitting adherance to the established Tradition . . . of maintaining the Exacting Craftsmanship so consistently associated with our products.

THE CITY AUTO STAMPING COMPANY
THE CITY MACHINE & TOOL COMPANY
TOLEDO, OHIO









### The home laundry industry -- and Whirlpool

(Continued from Page W-7)

days when the housewife hid her washing machine in a dark corner of the basement and didn't admit that she used it herself are gone, too.

An underlying point of strength which all of us in this industry enjoy, of course, is the fact that our product is no longer a luxury, but is a necessity in every American home, and therefore its total volume is geared to the constant population growth, as well as the very marked social changes which have brought about the mechanization and the labor saving ideas in the home.

Today's housewife is proud of her laundry equipment and of how well she uses it. Housewives have been aided and abetted in changing their attitude not only by the designers in our industry, but also by the editors and architects.

3. Seventy-six per cent of American housewives with homes that are wired have a washer. Only 17% have automatic washers, and less than 5% have dryers. Filling the original demand for automatics will take a long time, and both products are so new that the replacement market is almost entirely a thing of the future.

4. Rapidly improving designs in automatic washers and dryers are enabling us to shave costs more and more all the time. We're giving the customers more for their dollar every year. This will be a factor for many years to come, and cost reduction will constantly expand the market.

Question: Mr. Gray, you have indicated that the automatic washer now accounts for the biggest volume in the home laundry appliance field. What do you think is the future of the wringer washer?

Answer: I think the wringer washer faces a slowly diminishing market. But since this market still constitutes a million and a half units a year, it's mighty good business and will continue to be for many years to come. We'll stay with it.

Question: Mr. Gray, when I looked over industry production figures during the post war years, I also looked at some of Whirlpool Corporation's recent annual reports. I found that your sales in 1948 were about \$42,500,000. In 1952, they were well over \$118,000,000. This would indicate that your growth has been considerably faster than that of industry as a whole during the post-war years. To what do you attribute this?

Answer: One of our big reasons is our double-barreled distribution system. A large part of our production is sold through the Whirlpool sales organization made up of seventy-nine distributors serving twelve thousand retail dealers. Another large part of our production is sold by the Sears organization through its retail stores. This doublebarreled outlet gives us three distinct advantages. First, we gain sufficient volume to support a most extensive engineering, research, and tooling program. Second, we maintain very close touch with retail stores from coast to coast, and thus have a great sensitivity to the market day by day. Third, we have a very close check on quality control problems that arise in the field through daily reports direct to the plant from the service men who call on the customers in their homes in a carefully selected crosssection of the national market. Thus we are able to get right on top of any problems that show up in the field and eliminate them before they become serious.

Question: As I visit one plant after another throughout the middle west in interviewing for finish, I find that almost every company has a sort of personality of its own—an indefinable feeling that you get throughout that company. I get this feeling of a company personality very strongly at Whirlpool, but I cannot define its characteristics. How would you characterize the Whirlpool personality?

Answer: It seems to me that the kind of work that goes with rapid growth and change produces a kind of thinking and action. It develops a momentum that pervades the plant. We have a kind of enthusiasm and exuberance here that we were forced to acquire. We grew rapidly to satis-

fy our market; as a result young fellows in our organization have come along very rapidly. And because they are accustomed to facing big problems and whipping them, these fellows seem to have a perfect assurance that every new problem can be met and surmounted. They have had a whole lot of experience packed into a very few years. This has given them a very positive kind of approach that combines self-confidence with respect for the other fellows' ability. That makes real teamwork a vital force in our operation. It's the most important asset we have.

### Engineering . . .

→ from Page W-9

tampering with mechanisms that are normally fool-proof.

Question: What effect will new detergents have on specifications of moving parts in automatic washers? That is, parts that come into contact with the detergent.

Answer: Any current Whirlpool machine can use any of the present detergents without danger of corrosion of any kind.

Question: Are there any metals not now in use that could be used to good advantage?

Answer: If there are any metals that could be used advantageously in the laundry appliance industry that we are not using I am unaware of them. I believe we are using everything in this field to advantage, and constantly looking for others.

### Marketing . . .

→ from Page W-11

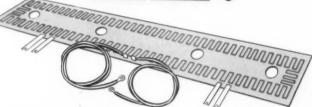
Last year we inaugurated a series of service training schools for our own distributors and dealers, as well as for independent service organizations. The purpose of this program is not only to improve our own servicing but also to acquaint this important segment of the appliance industry with some of our activities. We believe that if we expect our field force to receive and heed our instructions, admonitions and directives, we must also be attuned, and receptive, to their reactions, opinions, and judgments. We also find it much easier to do business this way.

### HEATING ELEMENTS

FOR Whirlpool

AUTOMATIC ELECTRIC CLOTHES DRYER AND IRONER





Nykelkrom's "Patternized Heat" mica clad ironer element





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W-51





### DESPITE REPEATED TUBBINGS

### TITANOX°TG

### **KEEPS PORCELAIN SPARKLING**

Daily splashing battles with Junior in the bathtub emphasize the importance of bright, easy-to-clean, porcelain enamel surfaces. Acid resistance for cast iron enamels, and opacity and other qualities of titania enamels for sheet steel are provided by titanium dioxide for today's sanitary ware.

Frit makers find that TITANOX-TG titanium dioxide does not sludge out during smelting and disperses completely for maximum solubility and maximum yield in the enamel. In addition, it flows easily in the dry state, does not stick or ball-up and does not require pre-milling or hammer milling in most cases when

dry blending with other ingredients of the batch.

TITANOX-TG, and TITANOX-TG-400 for blue-white titania enamels, have established standards and reduced rejection rates for the porcelain enamel industry. Consult today with our Technical Service Department on the advantages for you in TITANOX frit formulations. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; Atlanta 2; Boston 6; Chicago 3; Cleveland 15; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 9, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.

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### Enameler's clubs meet - eastern, central and midwest

eastern enamelers elect officers — visit U.S.S. Fairless Works

THE Eastern Enamelers Club held its fall meeting on December 5, 1953, at the Pennsbury Inn, Morrisville, Pa. During the meeting, after the luncheon, the following officers were elected for a two-year term:

President: Paul S. Cecil, Seaporcel Metals, Inc.

Vice pres. & program chairman: James B. Willis, Pemco Corporation. Secretary: Alexis J. Hannon, Heintz

Manufacturing Co.

Treasurer: Dr. Robert F. Patrick, Pemco Corporation.

Following the meeting, which was attended by 141 members, a tour of

the new Fairless Works of United States Steel Corp. was held. This is said to be the most modern steel plant in the world and the largest constructed as a unit. A complete tour of the plant was made, including inspection of coke ovens, blast furnaces, openhearths, strip, tin, and finishing mills.

### midwest enamelers consider temperature extremes

THE Midwest Enamelers Club held its first fall meeting at the La-Salle Hotel, Chicago, on Saturday, December 12. A much larger crowd than was anticipated came to hear about high temperature enamels and porcelain enamels for aluminum.

Roger Fellows, Century Vitreous Enamel Co., new Club president, officiated at his first meeting.

John McLaughlin, program committee chairman, and associate technical editor for *finish*, introduced the speakers. He indicated that the day's program had been designed to present the two extremes in ceramic type coatings with respect to temperature requirements.

### Terry covers high temperature ceramic coatings

Jack Terry, Hotpoint Company, covered the use of high temperature coatings on a wide group of base metals, ranging from cold rolled through enameling grade steel, to Inconel.

Application of the coatings is accomplished by both dipping and spraying. For spraying, paint-type guns are used. This type gun is suitable because of the extremely fine grinding and the light weights of application. Drying is accomplished by infra-red combined with forced air circulation.

An interesting phase of the operation is the firing, which is accomplished on a roller-hearth type enclosed furnace, incorporating a controlled atmosphere feature and controlled heat zones.

Jet aircraft parts, heat exchangers, heat deflectors, and heat treating



Speakers at Midwest Enamelers Club meeting—Jack Terry (left), of Hotpoint, and Don Goetchius, of Ferro.

baskets are among the applications for ceramic coating at the Hotpoint, Milwaukee, plant, which was designed for this specific type of work.

Tests on these ceramic coated products include those for heat resistance, thermal shock, and abrasion.

### Goetchius discusses porcelain enamel on aluminum

Don Goetchius, assistant manager of ceramic sales for Ferro Corp., Cleveland, outlined seven questions as the ones most frequently presented by engineers and plant men making inquiry about the application of porcelain enamel to aluminum. He indicated that after the original announcement had been made (October, 1953, finish), that the company was deluged with inquiries from companies throughout the country.

In brief, the seven questions most commonly asked were: Why? — Where is the market? — Will it compete? — Cost? — How is it done? — Performance properties? — Equipment required?

The latter question—that of equipment — seems to be extremely important in the minds of those who indicate an interest in this comparatively new development.

With Goetchius was Richard Rush, sales engineer from Ferro's engineering division. He outlined the equipment requirements for successful porcelain enameling on aluminum, and the work that has been done to date in the development of suitable equipment for this operation. Electricity was indicated as a logical source of heat, with transfer of the heat to the ware through convection from an indirect heat source instead of by direct radiation. Radiant tubes have also been investigated, but with this heat source also used indirectly instead of as a direct heat source.

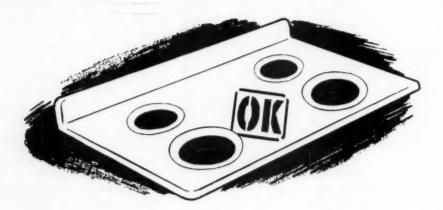
It was stressed that conventional enameling furnaces are not desirable because of the necessity for close control of curing temperatures.

Although much work has been done on phosphate type enamels and other

to Page 104



### D - E N A M E L I N G transforms "SECONDS" into "FIRSTS"



Reject or O.K.? These few words tell the story of D-Enameling. Ranges, bath tubs, sinks and washing machine tubs that once had to be rejected because of some defect in the porcelain enamel coating were either classed as "seconds", or scrapped as complete loss. But that was before D-Enameling. The story is different now. Scrap loss is at a minimum. Parts that

once had to be sold as "seconds" can now be successfully D-Enameled and re-enameled into perfect condition for first line use. If you'll send us 3 or 4 defective parts, we'll process them for you at our expense. You'll see for yourself why D-Enameling is now a permanent part of the appliance manufacturing picture.

### New Process D-Enameling Corp.

Highland and New Haven Avenues • Aurora, Illinois



ng design panel — R. W. Hamilton, MIT Albert Farwell Foundation; E. X. Tuttle, Giffels & Vallet; J. C. Terry (moder-truco Steel; William Lescaze, architect; B. B. Loring, Seaporcel.



Properties of porcelain enamel — Dana Chase, finish; G. H. Spencer-Strong Pemco; G. H. McIntyre (moderator), Ferro; G. A. Hutt (chairman), Ferro; G. W Parker, Oak Ridge Laboratory; E. E. Howe, Chicago Vitreous; D. G. Moore, Bur. of Stds

### Expanding market seen for porcelain enamel in building industry

conference in Washington, D.C., sponsored by Building Research Advisory Board and the Porcelain Enamel Institute

A BRAND new market for Porcelain Enamel as a building and engineering material may open up as a result of the recent conference on "Porcelain Enamel in the Building Industry" held at the National Academy of Sciences, in Washington.

G. W. Parker, a senior chemist at the Oak Ridge AEC Laboratory, stated, "Because its fundamental chemical properties - resistance to contamination and ease of decontamination - are essential in radioactive chemical work, porcelain enamel is better suited than other materials such as stainless steel, plastics and other materials for the construction of fume hoods, fume ducts, glove boxes and work surfaces." Parker's paper, reporting the extensive research conducted by AEC for suitable laboratory construction materials, was entitled, "Radiochemical Decontamination Properties of Porcelain Enamel."

Ernest H. Dhein, of the U. S. Army Corps of Engineers, who cooperated in the preparation of the paper, said that since porcelain enamel is easy to decontaminate, it is also the best material for exterior building construction where radioactivity is feared due to possible enemy atomic attack. "The only problem", he said, "is to

get more exterior surfaces built of porcelain enamel".

Interpreting Parker's talk, Edward Mackasek, managing director of the Porcelain Enamel Institute, commented, "This opens up an entirely new and vast market for porcelain enamel as an engineering and building material. It is possible that thousands of square feet of porcelain enamel could be used: as replacement material in modernizing present atomic laboratories; in hospitals where radioactive isotopes are important in the treatment of certain diseases; in industry where there is a rapidly growing demand for isotopes in new industrial applications - in fact, wherever radioactive isotopes are used and handled."

Porcelain enamel on aluminum, while a relatively new field, is expected to expand and acquire a good percentage of business in the building industry. The coating enhances the metal's existing properties and adds new properties: a wide color range, durability, resistance to corrosive atmospheres and alkalis, and increased rigidity were cited. Its inherent lightness makes it easy to handle on the job. It was further pointed out that porcelain enamel on aluminum has excellent workability;

it may be sheared, cut, drilled and even riveted with very little loss of enamel, thus shows good resistance to spalling or flaking off. Due to its light weight, low cost in packing and shipping was also named as an advantage.

The steel and aluminum manufacturers have ceased viewing the building industry merely as a great potential market; they are actively, aggressively at work developing this market, believing that the use of metal wall panels, both exterior and interior, will account for increasing percentages of their production volume.

The two day conference was sponsored jointly by the Building Research Advisory Board and the Porcelain Enamel Institute. Previously BRAB-sponsored conferences have dealt with broad subjects crossing many diverse segments of the building industry. Now, with the apparent success of this conference, it is expected that other specific building materials will be the subjects of BRAB conferences.

Attendance at the conference numbered over 225, including architects, engineers, contractors, builders, government representatives and others interested in the building field.

ering material — F. R. Nagley, Bur. of Ships; B. C. Bricker, Du. C. Myers (moderator), U. S. Steel; Dr. A. I. Andrews, University of Illinois; and Prof. Elmer R. Queer, Penn. State College.



Building construction — J. J. Souder, of York & Sawyer, Kiff, Colean, Voss & Souder; Milton Male, U. S. Steel; W. H. Scheick, BRAB; P. R. Fritsch, Goodyear; W. W. Lobdell, Lobdell Realty & Construction.



### **New Industrial Literature**

### 101. New 1954 edition of Calrod heating catalog

The new 1954 edition of General Electric's catalog on Calrod electric heaters and heating devices contains more than 175 photographs and drawings which illustrate various products, including thermostats, switches, oven heaters, and immersion, strip, cartridge, tubular, insertion and fin heaters.

The 60-page two-color catalog describes the units in terms of application, special features, installation and pricing.

### 102. Fastening specialties handbook

New This fully-illustrated 24page handbook, describing Southco Fastening Specialties, has a



section devoted to each of seven different fastener types: screw fasteners,

blind rivets, adjustable pawl fasteners, door latches, spring-grip fasteners, anchor nuts and door retaining springs. Each section has photographs, drawings, tables of dimensions and sizes, and descriptions.

#### 103. Electrostatic spray literature

New A new 16-page brochure describes how the Ransburg No. 2 Electro-Spray Process works, and provides paint and labor savings, by case-history presentation of 27 production painting jobs on a wide variety of sizes and shapes of parts and products. In addition, Ransburg's laboratory facilities are pictured, and complete information on test procedure is given.

### 104. Refrigeration control replacement reference manual

New A new Ranco replacement reference manual, replacing the manual issued in 1949, is available to refrigeration service men through their Ranco wholesaler. The manual is considered the most comprehensive manual of its type in the refrigeration field. It lists over 4,636 replacement refrigeration controls.

### 105. Welding move in color

A demonstration of the latest techniques in welding aluminum, using both the tungsten are and consumable electrode meth-

ods, is shown in Alcoa's new 28-minute, 16 mm. film, "Welding Advances with Aluminum," which can be borrowed for group showings.

### 106. Fabricating shells for ranges, washers, dryers, refrigerators, freezers, space heaters, etc.

New This new 28-page two-color catalog describes the important tangent bending process used in the fabrication of shell bodies for



major appliances. It also contains actual production photos taken in the fabrication departments of producers of ranges, washers, dryers, space heaters, room air conditioners, freezers, refrigerators, etc.

The sequence presses are said to have paralleled improvements in refrigeration units, and have substantially lowered the cost of making outer shells, inner liners and frost chests.

### 107. Electroplating aluminum

New The leading article in Reynolds Metals latest "Technical Advisor" details the recent developments in electroplating on aluminum. The new processes discussed include wet blast chromium plating, the use of conductive rubber coatings, and the modified Vogt process.

#### 108. Thermo-spray finishing

New A new brochure describes a hot spray method, known as Therm-O Spray, for applying fine finishes to all types of appliances and metal products.



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Capacity	1200 ton drive)
Type of frame	Steel - Tie Rod
Area of slide, FB x RL	60" x 106"
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Area of bolster, FB x RL	60" x 114"
Opening in bed, FB x RL	41%" x 74"
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Shut height, stroke down, adjustment up, bed to slide	o top of bolster
Size and speed of main drive motor required and furnished100	HP - 1200 RPM
Weight complete (approx.)	240,000#

#### SPECIAL FEATURES AND EXTRAS INCLUDED

- Square type gibs adjustable in both directions. Steel bolster plate with 118 1-5/16" pin holes and 34 7/8" hold-down holes.
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  magnetic reversing starter in NEMA type 1 enclosure with over-
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Verson Type 2UH24-10 Hydro-Pneumatic Die Cushion in bed. Capacity 226 tons @ 500# pressure. Stripping capacity 45.2 tons @ 100# air pressure. Stroke 10".

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### **Enameler club meetings**

-> from Page 99

formulae for aluminum enamels, to date the most successful applications are confined to lead-bearing enamels. These give better range of texture, color, etc.

More complete information on the application of aluminum enamels and the equipment required for this operation will be published in later issues of *finish*.

made at the Middletown, Ohio, plant.

# One instrument of interest for physical testing was the motorized "bend resistance tester," modified in Armco's Laboratory to allow simultaneous direct reading of the resistance of the specimen being tested. Press a button, read the scale — plot — and you have the curve for the specimen.

The tour included observation of routine and research chemical analysis and tests in a departmentalized series of laboratories where each chemical analytical section in separate labs perform specialized tests... one lab for sulphur; one for carbon, manganese, etc. A separate lab is reserved for non-ferrous testing.

The lab for testing and controlling the electrical properties of Armco's product employs, among other things, electronic and electromagnetic instruments which indicate the electrical properties of materials, some of which become the "memory" or central brain of the electronic computers such as those used in advanced astronomy, ballistics and aeronautic analysis.

At the mills, the group was conducted step by step through the making of enameling grade iron. From the point where the ore is moved to a waiting railroad hopper car and switch engine by a clam-shell crane that takes a 13-ton bite at a time, the group traveled to the open hearth furnace, through all major operations, to the rolling mills — then to pickling, drying, shearing, bundling and stamping for shipment.

Elapsed time for the plant trip was close to 7½ hours—"Sure we were tired, and our feet hurt, but it was instructive, fascinating, and exciting," said one enameler. "Every enameler should do it."

At a dinner following the lab tour, Bennett Chapple, "The Old Ironmaster," gave a stirring address on the possibilities for the porcelain enameling industry.

### **Adherence tests**

→ from Page 35

The validity of the principle of the spot deformation as used in this test is indicated by industry's extensive reliance during the past several years

### central enamelers see Armco make enameling iron

MEMBERS of the Central District Enamelers Club were guests of Armco Steel Corp. at a dinner and plant tour on Friday evening, November 12.

The enamelers first assembled at Armco's Laboratory, where the test

and research activities are carried on. Modern equipment performs many impressive tests to develop data to assist in continuous improvement of quality. There are many instruments for the physical, chemical and electrical testing of the iron and steel



on the falling-weight, visually evaluated adherence test to establish this aspect of serviceability. The PEI test is a refinement of this visually evaluated test. A hydraulic deforming press has been substituted for the falling weight because specimens deformed to a constant load of 2000 lbs. are more uniformly deformed. Further verification of this principle is found in the work of Harrison and associates.9 Figure 9 illustrates their findings on the correlation of roughness of enamel-metal interface with adherence indices in the case of conventional porcelain enamel ground coats. In view of (1) the general experience that satisfactory adherence in service is related to interface roughness, (2) the wellknown effect of cobalt oxide on enamel adherence and (3) the very good agreement shown here between interface roughness and adherence, this is considered evidence of the validity of

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#### Apparent vs. absolute adherence

As indicated, this is a destructive . test. While it is recognized that destruction of the test piece is usually undesirable, there are, in this case, advantages in a destructive test. The property being measured might be termed "apparent adherence" or "working adherence." This may be far different from the absolute adherence of the enamel to the metal. The absolute adherence would be a certain force per unit area acting perpendicular to the surface between the enamel and metal at the interface. A knowledge of such absolute values would be of little practical value without an extensive series of calibrations to relate the acceptable values with metal thickness, enamel thickness, type of metal, type of enamel, and service requirements. Some low strength enamels may, when deformed, fail readily within the enamel layer and only slightly at the interface. This is true even though other indications are that the absolute adherence is relatively low. It is evident then that adhesion need be only slightly greater than the cohesion within the enamel layer. Such a destructive test as this readily integrates the many factors that affect the

working adherence of the enameled metal into a numerical value that is related to service requirements.

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### Kitchen cabinet mfrs. meeting

→ from Page 40

who can do the complete job for them with a minimum amount of inconvenience to the buyer.

### **Business** is good

In 1952, the industry enjoyed sales of approximately 3,000,000 units of various types of steel cabinets: wall cabinets, base cabinets, sink cabinet combinations, and others, with a retail value of about \$150,000,000. Tentative figures compiled for 1953 indicate that the industry may have sold 31/2 million units, with a retail value of 178 million dollars - about a 15% increase over preceding year.

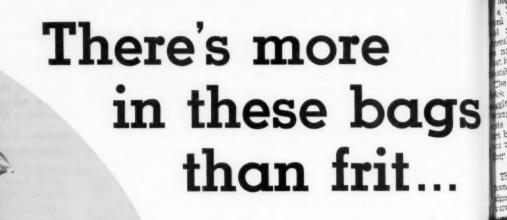


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In its first major expansion move, United States Air Conditioning Corp., has more than doubled its manufacturing space with the lease of a group of industrial and office buildings on a 25-acre tract adjoining its existing main plant and offices in Minneapolis.

During 1953, the firm's production increased 50 per cent, stated D. E. Feinberg, vice president and general manager. "The newly-acquired space will provide for greater expansion of production in the coming year," he stated.

# INGERSOLL PRODUCTS NAMES CREAN VICE PRESIDENT

Appointment of R. B. Crean as vice president of the Ingersoll Products Division of Borg-Warner Corp. was announced by R. S. Ingersoll, division president. Crean resigned as vice president of the Eddystone Division of Baldwin-Lima-Hamilton Corp. last spring to join Ingersoll Products. He will also retain his title as assistant general manager of the division.

# OLYMPIC RADIO ENTERS ROOM COOLER FIELD

Morris Sobin, president of Olympic Radio & Television, Inc., Long Island City, N.Y., has announced that his company will enter the room air conditioning field. The units have been

designed by Olympic engineers, but will be manufactured by other con-

### COOLERATOR NAMES DRAKE SUPT.

The Coolerator Company, Duluth, Minnesota, has announced that How-



ard W. Drake has succeeded R. J. Murray as general superintendent. Drake was formerly head of the porcelain plant, which now will be under the supervision of S. L. Cheslak.

### PERFECTION DIRECTOR DIES

G. L. Harrison, 78, a member of the board of Perfection Stove Co., died November 19, following a long illness. Vice president and general manager of Perfection until his retirement in 1947, he had been associated with the company for 41 years, during which time he became an authority of porcelain enameling processes.

# U. S. RADIATOR HEAD ELECTED FREEDOMS FOUNDATION TREAS.

W. C. McCord, president of United States Radiator Corp., Detroit, was elected national treasurer of Freedoms Foundation, an organization dedicated to the furtherance and preservation of the American way of life.

### UNION ASBESTOS ENTERS AIR CONDITIONING FIELD

Union Asbestos & Rubber Co., Chicago, has entered the air conditioning field with the purchase of Nevinger Mfg. Co., of Greenville, Ill., it was announced by Norman C. Naylor, president.

Carl Nevinger, founder and former president of Nevinger Mfg., will continue as general manager of the Greenville operation where the company's line of domestic, industrial, and commercial heating and air conditioning equipment will be produced.

### CORY MAN REELECTED V.P. OF AMERICAN FAIR TRADE COUNCIL

H. G. Blakeslee, vice president and general manager of Corp Corp., Chicago, has been reelected to the post of vice president and director of the American Fair Trade Council.

### PHILCO TO ENTER LAUNDRY FIELD WITH DEXTER PURCHASE

Philco Corporation has signed an agreement to acquire The Dexter Company, Fairfield, Iowa, manufacturers of washing machine and dryers, subject to approval of Dexter stockholders, it was announced by William Balderston, Philco president,

and Tom B. Hunt, Dexter president.

The Dexter Company has been engaged in the manufacture of home laundry equipment for nearly 60 years. Its present plant facilities are located in Fairfield, company head-quarters, and in Alliance, Ohio.

# As Appliance and Metal Production

The Only trade magazine offering a Complete editorial service to the appliance and metal products manufacturing field.

### 1. finish moves forward in Circulation

Circulation growth has been constant over the period of publication with a total increase from January 1944 to June 1953 of 109%. finish offers blanket circulation, increasing immediately with industry expansion.

### 2. finish moves forward in Editorial Service

As finish has grown new editorial services have been added, providing, since January 1949, a complete editorial service "from raw metal to finished product."

### 3. finish moves forward in Advertising Revenue

1953 shows a continuation (at an accelerated pace) of the year after year steady growth of advertising revenue. Advertising has been sold almost entirely on the strength of Editorial Content.

First advertising selection of the leading suppliers to the multi-billion dollar appliance and metal products manufacturing field. The black line and the percentage of under the line show the trend of adverrevenue in business publications. St INDUSTRIAL MARKETING, August, 1953.

The red bars and the percentage figures the bars show the trend of advertising nue in finish.

Appliance AND
Metal Products MANUFACTURING

Dana Chas

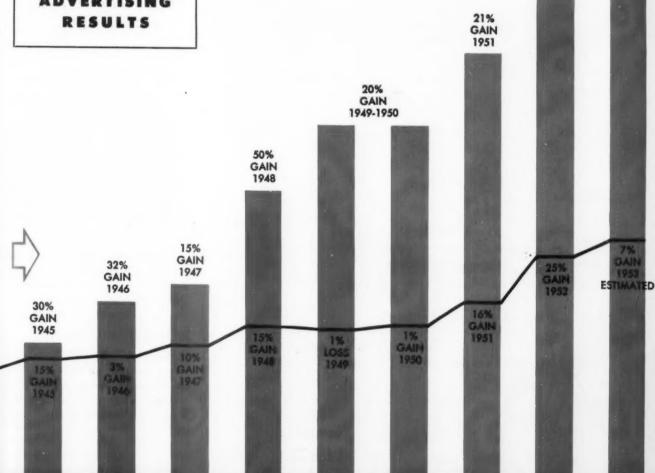
luc Manufacturing grows....

noves forward

32% **GAIN** 1953

13% GAIN 1952





TELEPHONES CEntral 6-1229 and 6-1263

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1953. figures ertising

360 N. MICHIGAN AVENUE . CHICAGO 1 . ILLINOIS

Philco plans to continue operation of Dexter under its present management as a separate unit. Its output of washers and dryers will be marketed under the Dexter name. Entry into the home laundry field will round out the Philco program of major appliances, which include refrigerators, freezers, electric ranges, air conditioners, radio and television.

### SERVEL ANNOUNCES MAJOR REASSIGNMENTS IN PRODUCTION

Reassignment of duties of production and engineering personnel at Servel, Inc., Evansville, Ind., were announced by Theodore W. Rundell, vice president in charge of operations, who said the changes were made to bring about a more effective consolidation of civilian and defense production.

Following are the production men

involved, and their new assignments: Herman Kraemer, special duty under Rundell; E. G. Schiff, manager of civilian production; Jack Ritter, general superintendent of refrigerator unit and cabinet divisions; Thomas Smith, superintendent of room air conditioning division; A. H. Counts, superintendent of commercial refrigeration division. (R. P. Marshall continues as superintendent of all-year air conditioning division; Earl Voight as superintendent of sheet metal division; and R. V. Phillips as superintendent of manufacturing service divisions.)

John Davidson, manager of all defense production operations; Ellwood Conner, acting head of manufacturing of cartridge case division; Harry Axford, superintendent of miscellaneous aircraft parts section. (C. E. Deig continues as superintendent of the wing assembly division, and Vincent Gleason as superintendent of the spar machining division.)

Dr. Robert S. Taylor, director of quality control; Dr. Carl T. Ashby, chief engineer of refrigerators and freezers; A. C. Shuart, chief engineer of defense engineering.

### LOTH ACQUIRES ROCKWOOD LINE

Loth Stove Co., of Waynesboro, Va., is reported to have purchased all patterns, dies, tools, fixtures and repair business of Rockwood Stove Co., Rockwood, Tenn., and will add "Rockwood" coal and wood ranges and heaters to its line of products. Loth Stove is a division of Virginia Metalcrafters, Inc., and is headed by Charles M. Eckman, president.

# SORENSEN NAMED EXEC. V.P. OF MOTOR PRODUCTS

L. J. Sorensen has been named to the new post of executive vice president of Motor Products Corp., manufacturer of automotive parts and Deepfreeze home appliances, it was announced by L. G. Jacques, president.

In his new capacity, Sorensen will assist Jacques in supervising all operations of the firm. He plans to maintain offices at the Deepfreeze headquarters in North Chicago, Ill..





and at the parent company's headquarters in Detroit.

#### STARK HEADS PEERLESS ENGR.

Peerless Manufacturing Corp., Louisville, has appointed Marvin Stark as director of engineering, with full charge of all engineering and development activities. Stark was previously with the Herman Nelson Division of American Air Filter Co., and before that with Lennox Furnace Co.

# PRESSED METAL INSTITUTE SETS TECHNICAL MEETING, NAMES PROGRAM COMMITTEE

The 1954 annual Spring Technical Meeting of the Pressed Metal Insti-



JAMES L. CHASE

tute will be held at Hotel Carter, Cleveland, Ohio, March 17, 18 and 19.

James L. Chase, of E. W. Bliss Company, Detroit, is general program chairman for the meeting. His committee consists of Frank Humberger, of Technical Metal Processing, Inc., Cleveland; Frank Schmidt, of Jackson Metal Products Co., Jackson, Mich., and Philip C. Wood, of The Acklin Stamping Co., Toledo.

Subjects to be discussed on March 18 and 19 include "In Process Material Handling" and "Resistance Welding". Those in attendance will have an opportunity to visit three plants in the Cleveland area.

"Safety in a Stamping Plant" will be the theme of the first day's meeting. The 1953 Technical Meeting inagurated the safety program and its success encouraged PMI's Technical Research and Standards Committee to annually expand the meeting to a three-day session with the first day dedicated to accident reduction in the metal stamping industry.

### A. O. SMITH BUYS GLASCOTE, HICKEY NAMED VICE PRES.

A. O. Smith Corp., of Milwaukee, has purchased Glascote Products, Inc., of Cleveland, a manufacturer of glass-coated equipment for the chemical industries.

Glascote, founded about 35 years ago, will be operated as a subsidiary of A. O. Smith and will retain its present name. L. T. Hickey was named vice president and general manager of Glascote.

### BURNS NAMED DIRECTOR OF GOVT. IRON AND STEEL DIVISION

The appointment of Kenneth J. Burns as director of the Iron and



Our engineers know that efficient, economical production—without sacrificing product quality—is our constant goal on all contract manufacturing. That's why they devote so much care to the detailperfect designing of precision dies and jigs.

### Learn How Contract Manufacturing Can Help You Cut Costs

Before you go to the trouble and expense of expanding your own facilities, check with New Monarch. Many of our customers have found it much more profitable and convenient to use our modern equipment and extremely efficient services. And they know that a contract with us unfailingly means top quality, exact specifications, and prompt, on-schedule delivery.



New Monarch's from-blueprint-to-shipping-carton service includes dies, tools, stampings, assembly, fluishing and packing. Send blueprints for estimate.

NEW MONARCH MACHINE & STAMPING COMPANY

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Steel Division, Business and Defense Services Administration, Department of Commerce, was announced by Charles F. Honeywell, administrator. Burns, who is manager of sales, sheet and steel division, Inland Steel Co., Chicago, served since October 1 as deputy director and acting director.

# JONES, STRATHEARN TO NEW HOME LAUNDRY POSTS AT AVCO

Parker H. Ericksen, vice president of Avco Mfg. Corp., and general

manager of the appliance division, has announced that J. Paul Jones, director of Bendix laundry engineering, is now director of laundry research and development for Avco. Ericksen said this change was made to enable Jones "to devote his full attention to advancing the timetable on a special project."

It was also revealed that Donald M. Strathearn has been named director of engineering, and will assume direction of the laundry engineering



J. PAUL JONES
DONALD M. STRATHEARN



department at South Bend, Indiana, with full responsibility for product design and testing, and will coordinate this activity with laundry production.

# JAY BROILER TO MAKE PORTABLE ROOM COOLER

Jay Broiler Co., Long Island City, N. Y., is reported to have attained exclusive manufacturing rights for a new type portable two-section room air conditioner. It was indicated that a new firm, New-Aire Corp., has been established by Jay Broiler for production of the unit.

# PLANT OPERATIONS IN DALLAS

Dearborn Stove Co., Dallas, has announced that plans are being completed for the construction of a new

PROTFECTS

against

burnouts

Robertshaw

thermostat with

over- temperature

cut-out



Combines temperature control with single pole switch. Current is automatically cut off and switch is locked in open position if temperature at any dial setting, through any cause, exceeds temperature range of control by approximately 7% in liquids or 12% in air. Switch remains open until closed by manual reset button. Design permits mounting control in any one of four positions. Standard size bulbs and capillary tube lengths give great flexibility to meet required heat ranges and installation needs. In direct or reverse acting models. Write for Catalog.



ROBERTSHAW THERMOSTAT DIVISION, Youngwood, Pennsylvania

plant in Dallas. The plant will have 150,000 sq. ft. of manufacturing space.

Pending completion of the new plant, 25,000 sq. ft of space had been added to the present Dallas plant in order to provide temporary space for the production of products formerly made in their Chicago plant which has been shut down.

### PORCELAIN ENAMEL INSTITUTE APPOINTS RESEARCH FELLOW

James H. Giles, Jr. has been appointed the Porcelain Enamel Insti-



tute's Research Fellow at the National Bureau of Standards, in Washington, D. C. He was graduated from North Carolina State College in 1950 with a B.S. degree in ceramic engineering, and completed his work for an M.S. degree in July, 1951, at the same college. Before his present appointment, Giles was associated with the Cement Reference Laboratory at the National Bureau of Standards.

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### '53 FOOD WASTE DISPOSER SALES

Sales of food waste disposers in 1953 expected to total about 350,000 units, the Plumbing and Heating Industries Bureau estimates. Sales by 26 manufacturers were running about 30,000 per month during the year.

### C. V. HILL NAMES NEW OFFICERS

Recent changes in executive positions at C. V. Hill and Co., Inc., Trenton, N.J., include the following: J. S. Hill, chairman of the board; C. V. Hill, Jr., president; Herbert A. Stewart, vice president; and H. R. Mc-

Phail, works manager. Stewart is also vice president of Savage Arms Corp., the parent firm.

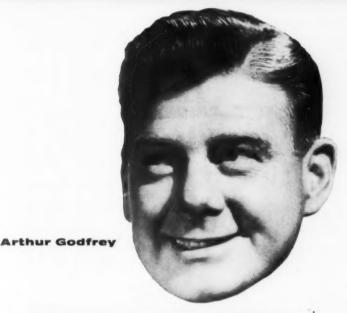
### WHIRLPOOL NAMES MAHAFFAY DIRECTOR OF ENGINEERING

Elisha Gray, president of Whirlpool Corp., St. Joseph, Mich., has announced the appointment of W. E. Mahaffay to the post of director of engineering, with responsibility for all research development and product engineering. P. Eduard Geldhof, vice president of engineering, will operate in an advisory capacity on engineering. He will devote a great portion of his time to surveys in new markets, new business, and on the initial phases of engineering in foreign markets.

### RADIOCERAMICS SYMPOSIUM

The first Symposium on Radioceramics will be held January 13 at Rutgers University, New Brunswick, N.J.

### OUR PLANTS are part of your production line...



"Fiberglas" Insulation
is one of the best
sales features
you can give your dealers"

Listen to Fiberglas' "GODFREY DIGEST" every Sunday on CBS



finish JANUARY . 1954

### NATL RADIATOR BUYS VIKING

It is reported that National Radiator Co., Johnstown, Pa., has purchased Viking Air Conditioning Corp., Cleveland, Ohio, and that Marion I. Levy, Viking president, has been elected a vice president of National Radiator.

### REFRIGERATORS ARE BIG USERS OF PLASTICS

Approximately 115,000,000 pounds of plastics of all kinds were consumed in the production of approximately 4,000,000 electric refrigerators in 1953, Lee H. D. Baker, vice president-appliances, Admiral Corp., said in a year-end statement.

"Approximately 31 pounds are used in our two-door Dual-Temp model, which is equivalent to nearly onetenth of the refrigerator's total weight," stated Baker.

### G-E NAMES FISHER MANAGER OF KITCHEN CABINET SECTION

The establishment of a kitchen cabinet section in the electric sink

C. P. FISHER, JR.

and cabinet department of General Electric Co., Louisville, with Clayton P. Fisher, Jr. as manager, has been announced by Harold T. Hulett, department general manager. Fisher recently served as manager of materials and purchasing for the company's major appliance division, a post discontinued with the transfer of individual product department purchasing operations to Louisville.

### ENAMELED CAST IRON GROUP NAMES COUCH CHAIRMAN

With the new home construction expected to run between 900,000 and 1,000,000 units in 1954, a continued high level of sales in the plumbing fixture industry is expected. This was the opinion expressed at the recent annual meeting of the Enameled Cast Iron Plumbing Fixtures Association.

D. D. Couch, vice president of American Radiator & Standard Sanitary Corp., Pittsburgh, was elected chairman.

Other officers are: O. A. Kroos, executive vice president, Kohler Co., Kohler, Wis., vice chairman; and H. J. Held, vice president, Universal-Rundle Corp., New Castle, Pa., treasurer. Members of the executive committee, in addition to the officers, include D. J. Crane, vice president, Eljer Co., Ford City, Pa., and W. G. Moore, president, Humphreys Manufacturing Co., Mansfield, Ohio. I. J. Fairchild, Washington, D. C., continues as secretary.

Through the years, we have experienced a profound pleasure in developing and manufacturing EXTRUDED rubber and plastic products for the Major Appliance Industries —

- · WASHING MACHINES
  - · CLOTHES DRYERS
    - · IRONERS
      - · REFRIGERATORS
        - · HOME FREEZERS
          - · VACUUM SWEEPERS

It is with confidence that we face the future and challenge of newer, better, and more advanced units requiring skill and know-how in producing rubber and plastic products to meet these new demands.

We will continue to welcome your inquiries, problems, and requests for information from any and all of our Administrative and Technical Departments.



### FASHION AWARD TO QUICFREZ

The gold medal of the Fashion Academy, symbolizing the Academy's annual awards for excellent industrial design, was presented in December to Quicfrez, Inc., Fond du Lac, Wis., producer of refrigerators.

The medal was presented by Mrs. Emil Alvin Hartman, Academy president, to Harry Ryan, vice president of Quicfrez, who accepted it on behalf of his company.

### Stove meeting . . .

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### The changing times

One of the highlights of the General Sessions was an interesting address, "The Changing Times," by Murray Shields, vice president and economist, Bank of the Manhattan Company. The following represents a brief excerpt from his discussion of economic problems.

Under the present circumstances prudence dictates that everyone individuals, business, associations and the Government - do a bit of post. boom planning. Future events may, to be sure, make such planning unnecessary. If enough of us did a very realistic job of post-boom planning it might spare the Nation from any set back at all. In any event, such planning might enable us to avoid having to run for the storm cellar if the economic weather were to turn against us and, furthermore, show us how we can productively use any set back in business to step up the development of new markets, to increase investment in more efficient equipment, to develop new capacity and to strengthen our organizations.

"But whatever concern one may feel with respect to the short term outlook, there is no reason to doubt that the long range future of the U.S. is to be one of really spectacular expansion and progress."

Mr. Shields presented detailed graphs and much statistical data in support of this last remark.

### "What would you do?"

The ICHAM Academy Award Actors, including such notables as Dick Guthrie, Fred Kaiser, S. P. (Skeets) Rymer, Walter Muhlbach. and Bill Armel, were introduced at the Tuesday afternoon session in Pavillon Caprice with clever characterizations in a series of skits depicting the eight most vexing problems for plant management.

Each skit was acted out (with drama and pathos) to show the buildup of such problems as are normally presented by salesmen and as developed in the plant under current operating conditions.

The session was arranged by John

W. Mock, trade association consultant of Evanston, Illinois. J. L. Moore, Jr., director of operations research, The Coleman Company, Inc., emceed the skits.

Specific suggestions from the floor in answer to "What would you do?" following each skit were projected onto a screen, with commentary by Pauline Dunckel.

This session proved to be one of the most popular of the entire program.

Material: Clay Slip.

**Problem:** Short pump life caused by abrasion.

Selution: Moyno handles slip of 1.8 specific gravity—and gets about 1 year service on rotor and stator. Customers well pleased.

Material: Special Navy Paint.

Problem: Low volume of gear-type pump; necessity for pre-heating paint before pumping.

Solution: Moyno cuts tank-car filling time from 10 hours to 2½ hours. No maintenance costs for past two years! Material: Paint Primer and Surfacer.

Problem: Finding pump that would offer reasonable service life.

Solution: For past 2 years, Moynas have been pumping these abrasive materials at 40 p.s.l.—and maintenance costs are minimum.

Material: Baking Enamel and Primer.

Problem: Recirculating abrasive material in closed system at 90 p.s.i.

Solution: Moyno pumps used successfully, with minimum repairs, for the past 4 years and are kept in operation 24 hours per day.

# Four Industrial Finishing Problems Solved With The MOYNO PUMP!

### Features of the MOYNO that may solve YOUR pumping problem

Positive Displacement — Moynos pull up to 29" vacuum while discharging under pressure. Big Moynos deliver up to 250 g.p.m. at pressures to 600 p.s.i.

Gentle — no churning; won't break up semisolids; won't aerate liquids.

Reversible — pumps with equal efficiency in either direction.

Looking for a pump with a fast-growing reputation for solving tough problems? Takealookatthesimple, versatile Moyno!

Briefly described above are a few of the many successful case histories proving how Moynos handle jobs where other pumps failed. Why is the Moyno a "problem-solving" pump? For one thing, because it differs completely from conventional pumps—rotary, centrifugal or piston. Just one rugged moving part—a rotor turning within a stator—does the job.

If you have a pumping problem caused by abrasive or corrosive materials watery, viscous or even semi-solid—find out if the

Moyno can help you! Mail the coupon.

Versatile — handles liquids, slurries, pastes — even potato salad! Rotor and stator available in stainless steel, other alloys, or plastics to meet wide variety of applications.

Trauble-Free—self priming; won't cavitate or vapor-lock. Just one moving part—no valves to stick, no pistons to gum up. Built for touch service. Easy to maintain.

ROBBINS & MYERS . Inc. SPRINGFIELD 99, ONIO - BRANTFORD, ONT.

Robbins & Myers Pump Division, S	i, Inc. F ipringfield 99, Ohio
letin 30-B conta	ase mail free copy of Bul- nining details on construc- ion of Moyno Pumps:
Name	Title
Company	
Address	
City	State

### NEWS ABOUT SUPPLIERS



Pyramid Mouldings 25th anniversary - was observed December 12 in Chicago with an open house for employees and their families, with the list of entertainers headed by Bob Atcher (right), radio and television star. Pyramid had on display appliances and other products to illustrate the numerous types of mouldings that Pyramid makes. An interesting sidelight is that I. L. Reed, president, celebrated his 58th birthday the day before. Since its organization, Pyramid has made five expansions in Chicago alone. They also recently completed a new and similar plant (Western Mouldings), in Upland, California.



The Cyril Bath Company, Cleveland, announced the appointment of Charles R. Youmans to its sales staff.

Youmans has a background of sales and executive experience covering plant engineering, tooling, cost estimating, equipment specification, etc.,





I. H. MILLER



C. R. YOUMANS

with such organizations as Goodyear Aircraft Corp., Surface Combustion Co., Hupp Corp., and Vultee Aircraft Corp., of Nashville, Tennessee, among others.

### GLIDDEN NAMES MILLER REP. IN L. A. AREA

Lowell H. Miller was named industrial representative in Los Angeles for The Glidden Company, it was announced by Thomas N. Armel, national industrial sales manager.

Before joining Glidden, Miller helped establish and served as manager of the former Vedoc Paint Division of Ferro Corporation.

Miller, known to his associates as "Ted", will make his headquarters

WANT A BETTER PULLEY . . . OR A BETTER CASTER?





Whatever the appliance you manufacture, if it includes V-Belt Pulleys or moves on casters, it will pay you to consult NAGEL-CHASE!

Take pulleys for instance. Nagel-Chase is equipped to supply you with pressed steel, welded V-Belt pulleys in a wide variety of sizes and in several styles, including step down pulleys. These pulleys are precision built, designed so that they can never come loose from the hub.

Nagel-Chase Casters, long a standard in the washing machine industry, are available in a wide range of styles and sizes, with several types of non-marking rollers, suitable for conventional or automatic washers and other mobile appliances where a sturdy, easily operating caster is required.

Nagel-Chase has specialized in pulleys and casters for the appliance industry for more than a quarter century. They will gladly consult with you on your requirements.

WRITE FOR COMPLETE INFORMATION

MANUFACTURING COMPANY 2811 N. Ashland Avenue, Chicago 13, III. SPECIALISTS IN CASTERS AND PULLEYS FOR NEARLY A QUARTER CENTURY!





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KARL KAUTZ



F. B. BRYANT



I. I. SCHAFFER

at the Glidden offices at 4255 North

Produce Plaza, Los Angeles.

KARL KAUTZ JOINS VITRO

Karl Kautz has joined the research department of the ceramic division of The Vitro Manufacturing Company, Pittsburgh, it was announced by Joseph Boyce, division general manager. Prior to joining Vitro, Kautz was a sales representative and ceramic consultant. In his new position, he will have an active part in Vitro's expanded research program.

### JOSEPH LIND JOINS BURDETT

Joseph Lind, combustion equipment sales engineer, formerly associated with Carbomatic Corp., has opened an office for Burdett Manufacturing Co., of Chicago, at 53 Park Place, New York 7, New York. Lind will represent Burdett in sales of combustion systems and complete finishing systems, including ovens, spray booths, washers, etc., in metropolitan New York and the states of Connecticut and New Jersey.

### **UDYLITE ADDS TO CHICAGO** REGION

Joseph J. Schaefer and Francis B. Bryant have been appointed sales engineers in Udylite Corporation's regional sales office. Bryant's new headquarters are at Bettendorf, Iowa, and his district includes western and southern Illinois, Iowa and Nebraska.

### FERRO INSTALLS EIGHT NEW **ROLL-QUENCH SMELTERS**

Ferro Corporation, Cleveland, Ohio, has just completed the installation of eight new continuous roll-quench smelters in its Cleveland and Nashville plants, according to an announcement by C. D. Clawson, pres.

finish JANUARY . 1954

Roll-quench smelters have been found by Ferro to be the most efficient equipment for the production of porcelain enamel frit, Clawson said. Ferro has also finished an addition to its Cleveland warehouse, as well as an extension to its research and development laboratory there.

### STOLTE JOINS

### HARSHAW CHEMICAL

It is reported that Norman Stolte has left his position as ceramic engineer with The Enamel Products Co., Cleveland, and joined The Harshaw Chemical Co., Cleveland.



Chester H. (Bud) Leopold, Supervisor of Ferbert-Schorndorfer's Industrial Laboratory, is checking the stability of a special dip finish for kitchen cabinets.

One of Bud's pet projects is dip coating. An authority on the subject, he spends a lot of time in the laboratory and in customers' plants, helping to solve many dipfinishing problems. He takes the scientific approach to such problems . . . trouble-saving in the lab reduces trouble-shooting later.

For example, under Bud's direction Ferbert-Schorndorfer technicians devised the midget dip tank illustrated. This unique apparatus simulates the agitation in a 3000 gallon tank and determines the stability of the paint in advance.

Bud is typical of the men who make the F-S wheels turn . . . the men who constantly "agitate" for quality, custom finishes. Why not put your finishing problems in the hands of F-S?

### THE FERBERT-SCHORNDORFER COMPANY

A DIVISION OF AMERICAN-MARIETTA COMPANY

12815 Elmwood Ave.



Cleveland 11, Ohio

# DU-WEL STARTS PRODUCTION IN NEW PLANT ADDITION

The start of production in a new plant wing at Du-Wel Metal Products, Inc., Bangor, Michigan, recently highlighted the company's seven year record of expanding sales of zinc and aluminum die castings.

The company was incorporated in 1946. At that time Du-Wel had a production force of 35 employees and about 5,000 sq. ft. of factory floor space. Since then, annual sales volume has increased by about 600 per cent, and the company now has about 150 employees and about 30,-

000 sq. ft. of floor space.

Du-Wel is directed by Ted Bator, president; Dave Walton, vice president and general manager; and Edward Fergin, secretary. Louis E. Capek is plant superintendent, and Art Mueller, chief engineer.

### RALPH FORAKER RETAINED BY FERRO CORP.

News comes to finish that R. L. Foraker has been retained by Ferro Corporation on a consulting basis for work on special field service problems. Foraker was associated with Chicago Vitreous Enamel Product

Co. for a number of years as field service manager, and was more recently associated with Pemco Corp., on field sales and engineering work. He brings to his new connection a long record of experience and success in the porcelain enameling industry.

Announcement of the consulting arrangement was made by W. N. Noble, manager of operations for Ferro.

### TOBITT, OF ARMCO, DIES

Fred A. Tobitt, Sr., 71, an official of Armco Steel Corp. for many of his 40 years of service to the company, died November 18.

### Amana distributors tour newly-expanded freezer plant

company introduces "centennial line of freezers" and announces return to the air conditioning field

AT THE recent annual sales meeting of Amana Refrigeration, Inc., Cedar Rapids, Iowa, distributors toured the company's recently expanded plant and viewed production

line operations of the firm's "Centennial Line of Freezers" which were so named because they make their debut on the 100th anniversary of the establishment of the Amana Colonies.

The new 1954 upright home freezers are being produced in 12, 15, and 19 cubic foot sizes.

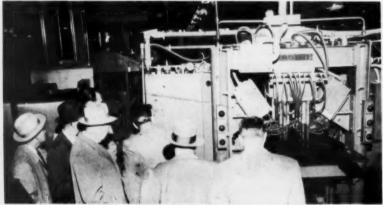
George C. Foerstner, executive vice president, also announced to the distributors Amana's return to the air conditioning field with three different sizes of year-round room units.

Although the firm had not made room air conditioners before, early in the 1940's Amana built and installed central air conditioning systems for many institutions and buildings in the mid-west.

### Rated output of 1000 units a day

The \$3,500,000 expansion program was said to have more than doubled the size of the plant, and tripled its production capacity for home freezers, with a rated output exceeding 1000 units a day.





Above left: Amana freezer distributors are shown viewing a roll-forming machine used in the first stages of preparing coiled steel stock for the start of the freezer manufacturing operation.

Left: A progressive automatic back welder, installed as part of the \$3,500, 000 expansion program, is examined by another group of distributors.

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# "CASE" HISTORIES FROM ATLAS PLYWOOD'S SHIPPING CONTAINER CLINIC

(Safe-Transit Certified)

New case designed by Atlas Plywood engineers weighs 47% less than previously used wooden box . . . holds contents more securely . . . reduces shipping costs

# THIS CASE WASTED MONEY

This cumbersome wooden box was the container previously used for shipping a unit cooler\*. On arrival at the Atlas Plywood Shipping Container Clinic, the gross weight of box and contents was 220 pounds. Because of inadequate blocking, the cooler was loose in the box.

# THIS CASE SAVED MONEY

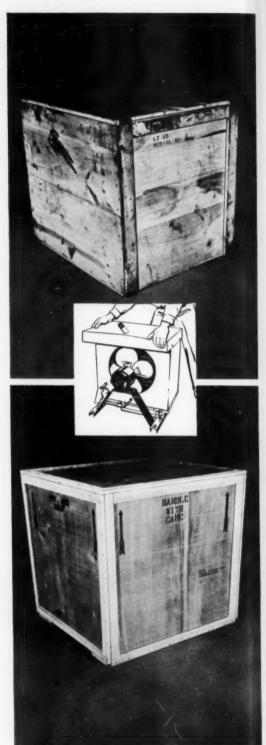
After thorough laboratory investigation, Atlas Plywood engineers designed this plywood case. Much stronger, and with more secure blocking than the old wooden box, it is a safer shipping container. And being 47% lighter than the box — 41 pounds as against 77 pounds — it reduces the gross weight by over 16%, for a considerable cut in shipping costs!

### CAN YOUR SHIPPING COSTS BE CUT?

There's one sure way to find out. At no cost or obligation to you, your present shipping containers can be tested in the Atlas Plywood Shipping Container Clinic, on equipment that simulates all conditions of actual transit. If improvements are needed in your container design, Atlas Plywood engineers will submit them for your approval.

It should then be pretty clear to you whether you can reduce your shipping costs, including what you pay for shipping the container and what you pay for damages.

This free service by Atlas Plywood — the greatest name in plywood — includes an invitation to come along and watch the tests. Your Atlas Plywood representative (see Classified Telephone Directory) will be glad to make the arrangements. Or write to Atlas Plywood Corporation, 1432 Statler Building, Boston, Mass.



\*Cooler made by Bush Manufacturing Co., West Hartford, Conn.

# **Atlas Plywood**

FROM FOREST TO FINISHED PRODUCT



### safe transit

A monthly trade publication section devoted to improved packaging and shipping and materials handling practices in the home appliance and metal products manufacturing field.

Plant experience information for all executives and plant men interested in the problem of packaging and shipping improvement and loss prevention.

Complete information on the National Safe Transit pre-shipment testing program for packaged finished products, and detailed progress reports of divisions and sub-committees of the National Safe Transit Committee.

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### 8 reasons why Sackner's CUSH-ON-STRAP will help you

- 1 ONE PACKAGE—high grade steel banding for strength; and protective, soft, fluffy cellulose padding, all in one unit.
- 2 CUTS LABOR COSTS—one man does the work of two. Standard tools used.
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- 7 WILL NOT STAIN OR MAR THE FINEST FINISHES.
- 8 WIDE RANGE OF USES—for packing automotive finished parts, dish washers, household furniture, ironers, machinery, metal kitchen units, office equipment, ranges, refrigerators, scales, washing machines, x-ray equipment, etc.

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The versatility of wirebound containers is well exemplified in the SUPERSTRONG Wirebound Pallet Box. You can use it on the production line ... for interplant transportation of parts... as a storage bin... as a shipping container which may be easily knocked down and returned for reuse.

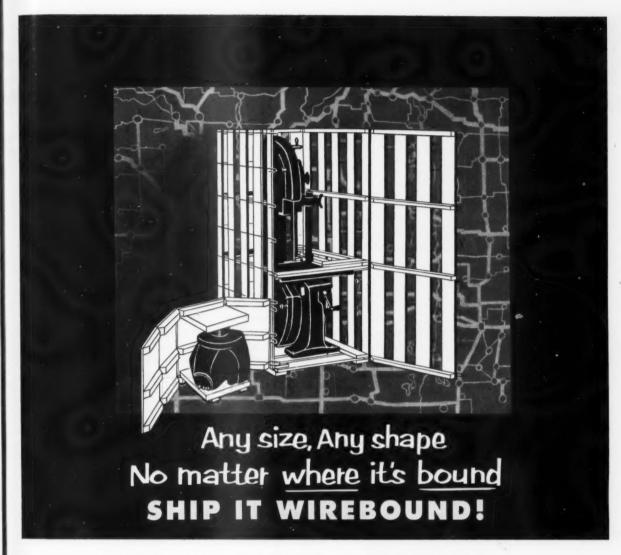
SUPERSTRONG Wirebound Pallet Boxes are light in weight, sturdily constructed—and offer an economical answer to materials handling cost problems. They are engineer designed and built to your individual requirements.

We would appreciate an opportunity to study your problems and offer our suggestions.





RATHBORNE, HAIR and RIDGWAY BOX CO.





There is practically no limit to what you can ship in a Wirebound . . . for Wirebound is a most versatile container. Wirebounds combine the strength of steel wire with the resiliency of wood in limitless combinations. For example, look at the rock bit box on the left. This small, rugged Wirebound eliminated previous stacking failure and in-transit damage losses. So did the Wirebound band saw crate on the right. For greater safety and greater savings, investigate Wirebounds . . . today!

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rish



The National Safe Transit Program was based on the premise that "all engineering, manufacturing and quality control efforts

are in vain if the product reaches its destination in a damaged condition." This article will cover the benefit to quality control. It is the author's hope that it will add to the understanding of how vital a phase of quality control the Safe Transit tests

In the 35 years I have been in this field of quality control of major appliances, with a company producing from 60 to 90 carloads of finished products a day, experience has spotlighted the information that I will present. I hope to be convincing enough that many readers of this article will take advantage of this

### A tool for better quality control

Manufacturers should control and maintain a uniform quality of the product by checking and testing a sample of each product daily, after the Safe Transit tests have been conducted.

Quality control techniques go to great lengths on the control of raw



by Ralph Bisbee • MANAGER, QUALITY CONTROL, WESTING ELECTRIC CORP., MANSFIELD, OHIO, AN ERAL CHAIRMAN, SAFE TRANSIT COMMIT

material, material in process and the finished product, but usually that is where control ends. It is obvious that pre-shipment testing of the finished Packaged Product is a vital phase of quality control that has been long overlooked.

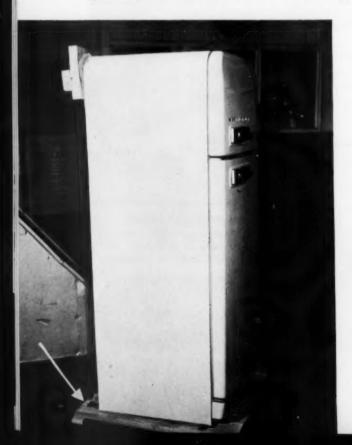
I wish to clearly set forth and prove that it is just as important to control the packaged product by predetermining if it will stand normal handling and transportation, as it is to control any other phase of the product through manufacture, in that inspection after pre-shipment tests reveals defects that cannot be found in any other way.

With the many variables in material, workmanship, and material substitutions that occur each day on any kind of product, many irregularities appear after transportation tests are made that are not visible before.

#### The "softening up" process

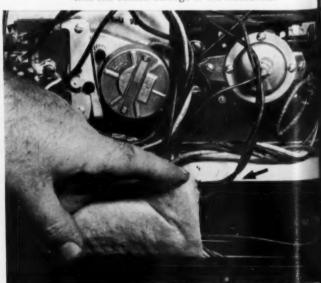
The Safe Transit pre-shipment tests first soften up the product by the vibration test that simulates the resonance incurred enroute by railroads and trucks. After vibration, the subsequent longitudinal shock, which simulates handling and switching of cars, shows up a weakness that would not be disclosed in any other way until after many thousands are made and reported back from the customers.

I will list just a few examples to prove that it is impossible to have true quality control without daily pretesting under the National Safe Transit procedures, which uncover defects that could not be found in any other



Mounting brackets . . . Crate mounting bracket improperly pos may result in latch escutcheon breakage and produce loosening bottom front panel.

Routing of wires . . . Wires were improperly routed, touching edge of the metal flange at the point indicated by the arrow. The tion test caused damage to the insulation.



# ackaged products

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the National Safe Transit pre-shipment testing program be used effectively for control of product quality as well as to prevent in-transit damage

way. I want to emphasize here that you cannot receive these benefits without religiously checking daily one or more of the packaged products from each shift's production.

### Safeguard for performance quality

The following examples are just a few of the typical things found by virtue of National Safe Transit tests: The first group would not be readily discovered by the dealer or customer in the way of damage, but would vitally affect the overall quality by way of performance.

 Vibration and shock dislodged the temperature control tube from its position in the electric range oven due to being improperly assembled. This would result in improper operation of the oven had it not been found.

2. Vibration and shock resulted in

damage to refrigerator unit tube, causing a slow leak. This was due to improper forming on the assembly line, and might have easily gone unnoticed, resulting in hundreds more being assembled in the same manner and not being discovered until slow leaks showed up in customers' homes.

3. Range leveling feet mounting brackets showed broken weld during Safe Transit test. This showed up as a defect in that the customer could not properly level the electric range, and also presented a possible source of chippage to the range body or the base during shipment.

Other common examples are:

- Routing of wires near sharp projections cut through insulation, causing electrical failure.
- 2. Electrical connections being loosened in National Safe Transit

tests due to connections not being sufficiently tight.

These are just a few examples affecting the quality by performance.

#### Result — damage in transit!

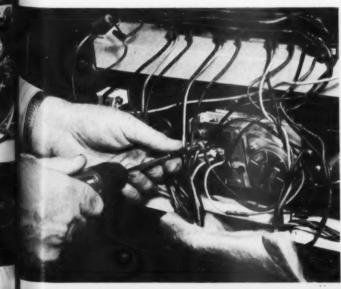
To enumerate some affecting quality by resultant damage in transit, the following are typical items revealed.

- New operator on the assembly line neglects to properly position packing and pad on electric range top, resulting in damage to top heater rings while in transit.
- 2. Substitute corrugated packing which had the same general appearance was used to pack electric roaster dishes. The Safe Transit test revealed that it broke down during vibration, and subsequent shocks produced breakage of the dishes.
- Improperly positioned refrigerator to crate mounting brackets resulted in latch plastic escutcheon breakage.

The National Safe Transit tests revealed the foregoing defects prior to being shipped to the customer, so that immediate corrective action could be taken. These would not have been revealed without the daily National Safe Transit test, as the original design of the packaged product (product, plus packing, plus container) had been approved. to Page ST-16 →

the packing . . . Improper positioning of packing and pad on electric range top could result in damage to the top heaters or loosening of their connections.

trical Connections . . . Operator is checking the screw type contions with a torgue screw driver. If these are improperly tightened during assembly, they loosen during the vibration test.





### Safe Transit laboratories meet in Chicago

THE National Safe Transit Laboratory Coordinating Division met with representatives of Safe Transit Laboratories at the Palmer House, in Chicago, on November 17. The purpose of the one-day meeting was to review the Division's overall activities and to discuss ways in which the program could advance to even greater achievements in the reduction of damage to packaged products in transit.

The meeting stressed the importance of manufacturers establishing minimum testing frequency. It was felt that testing laboratories could be of help in this regard. It was agreed that there is a need to emphasize that for Safe Transit approval, retesting is necessary when there is any structural change in the product such as a change in fasteners, braces, or in the product design, or when there is any change in the container, including a change in container design, interior packing, or source of container.

The group reaffirmed that testing should be emphasized in three basic phases, namely, (1) the importance of testing in itself; (2) the importance of retesting when there is any change in product or container; and (3) establishing a minimum testing frequency.

### NST tests save thousands as a quality control tool

Endorsing the program and adding the manufacturer's viewpoint was M. A. Ritchie of Geo. D. Roper Co., where a fully equipped Safe Transit Laboratory is installed. Mr. Ritchie stressed that every manufacturer who wishes to capitalize fully on the Safe Transit Program should be utilizing it as a daily quality control tool. He pointed out how his company is saving thousands of dollars each year by using it in this manner, and said that he felt any company that does not do so is missing a big opportunity.

Among many other subjects under discussion was the Safe Transit label that is used by manufacturers to identify packaged products that have met the pre-shipment test requirements. It was pointed out that articles and promotional material directed to handling personnel emphasized their responsibility in the safe delivery of packaged products bearing the red and yellow emblem. It was agreed that educational efforts along this line would be continued, and it was felt that it should be pointed out to manufacturers certified under the program that they are not realizing the full benefit of the program when they fail to identify their pre-shipment tested packaged products with the label.

It was also felt that a plan for closer control on the use of the label should be developed, and that the manufacturer must be made fully aware of his responsibility for seeing that packaged products so identified meet the requirements of the Safe Transit pre-shipment tests.

F. A. Petersen, chairman of the Laboratory Coordinating Division reviewed for the group the accomplishments of the program since it was initiated by finish and developed under the sponsorship of the Porcelain Enamel Institute. He mentioned the substantial savings realized by companies that are participating. He said the committee felt that further evidence of the acceptance and success of the program was in the growing list of certified companies and laboratories that now total 141 certified companies and 26 certified laboratories. Also, indicative of the benefits, he said, was the support of the 20 associations from manufacturer. carrier, container, and other fields.

Stressing the importance of cooperation in all the accomplishments to date, Chairman Petersen said, "It has been manufacturers, testing laboratories, container firms, carriers, and other supporting groups, working together within the framework of the National Safe Transit Program, that has marked the success of the program and will eventually reduce all in-transit damages to an absolute minimum."

Chairman Petersen also summarized a recent survey conducted with the laboratories in which they had indicated their belief in the merit of the program, and their conviction that every effort should be made to

to Page ST-10-

Photographers are warned that NST can be a photographic bugaboo. Three photographers at the 1953 national meeting failed to get satisfactory photos, and as is shown here, the laboratory meeting was a repeat performance.



Present at the meeting were:

F. A. Petersen
A. L. Ahlers
Wilmer J. Balster
C. S. Bather
R. D. Belster
C. S. Bather
R. D. Belster
P. W. Bush
J. Clark
L. Convissor
W. M. Cordel
G. L. Ferguson
E. S. Gaynes
J. P. Greco
J. F. Koerin
J. F. Koerin
J. R. Little
Ked R. Martin
Harry E. Miles
Fred K. Mueller
Robert E. Koeven
M. A. Ritchie
Joseph F. Konan
G. Sandelin
James A. Saryder
M. F. Weben
Charles J. Sour

Chairman, NST Laboratory Coordinating Divisi
The Mengel Company
Don L. Quint Company
Geo. D. Roper Corp.
Atlas Plywood Corporation
Chairman, NST Technical Planning Division
Rathborne, Hair & Ridgway Box Co.
Chairman, NST Educational Division
The Mengel Company
Inland Container Corporation
Twin Cities Container Corp.
American Kitchen Div., Aveo Mfg. Corp.
Dura-Cratos, Inc.
Gavnes Engineering Company
Bigelow-Garvey Lumbore Company
Gaylord Container Corp.
General Box Company
Hinde & Dauch Paper Co.
Fort Wavne Currugated Paper Co.
The Mengel Co.
Cozier Container Corporation
Inland Container Corporation
Inland Container Corporation
Cov. D. Roper Corp.
Gaylord Container Corporation
Cov. D. Roper Corp.
Gaylord Container Corporation
Cov. D. Roper Corp.
Caylord Container Corp.
Twin Cities Container Corp.
Container Laboratories, Inc.
Twin Cities Container Corp.

# GRAND CANYON?

The CANYON-LIKE EFFECT of this picture is created by 4-high stacks of packaged refrigerators in Admiral Corporation's new warehouse at their Midwest Mfg. Corp. plant in Galesburg, Illinois.

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Strength for stacking and modern handling before and after safe shipping are "must" requirements. Moisture absorption and material fatigue weakens certain types of packages while in storage. Such weaknesses are overcome by the structural strength of wood as shown in this picture and at no extra cost.

Proper design by our engineers, tests in a Safe Transit Laboratory and the "know how" of 72 years of progress and experience will produce the box or crate with the right combination of materials for the stacking, handling and safe shipping of your product.

> Wirebound, Nailed or Hinge Corner **Cleated Plywood Cleated Craveneer** Cleated Corrugated Watkins Type Containers Shop and Tote Boxes **Woodsteel Nesting Boxes**

FOR DOMESTIC OR EXPORT FOR PEACE OR DEFENSE

A shipping container for every shipping purpose



FOR SAFER TRANSIT BY . TRUCK . BOAT . TRAIN .









# (HICAGO MILL AND LUMBER OMPANY

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Chicago 3, Illinois

Tallulah, Louisiana

- Plants at: Helena, Arkansas Greenville, Mississippi
  - South Fork, Colorado
- Rockmart, Georgia
  - Chicago, Illinois



# Another good way to put the skids under your handling costs

### Through the packaging magic of Signode Steel Strapping!

Shown here is a successful adaptation by Signode of a basic skid-loading method, made for a shipper of tin plate.

This commodity can easily be a shipper's headache. It is heavy and slippery, and its surfaces are vulnerable — easily dented and scratched.

So Signode engineers wrapped each unit in heavy, moisturerepellent kraft paper, placed metal protectors on the edges, and fastened it to a skid with Signode Steel Strapping. Results? Safer, easier handling at lower cost!

Can Signode help you cut handling and shipping costs through practical adaptations of one or more basic skid-loading methods? It costs you nothing to find out! Write Signode Steel Strapping Co., 2639 N. Western Ave., Chicago 47, Ill. Offices coast to coast. In Canada: Canadian Steel Strapping Co., Ltd., Montreal, Toronto. Foreign subsidiaries and distributors world-wide.



SEND FOR FOLDER SHOWING 6 BASIC WAYS OF UNITIZING

### Safe Transit laboratories meet

-> from Page ST-8

advance it. He told the laboratory representatives that because of their close contact with manufacturers they had a large part in the educational program of the committee, which was directed at the dissemination of information on the importance of preshipment testing in good packaging, product design, and in maintaining quality control. He commended the laboratories on their outstanding services in this connection.

Educational and Technical activities were reviewed by Division Chairmen. Discussion on both these phases produced a stimulating exchange of ideas on ways in which the objectives of the program could be advanced.

John C. Oliver, secretary of the National Safe Transit Committee, concluded the all-day meeting by expressing the appreciation of the Committee to those in attendance. "In the coming months," he said, "we will all work together to put into effect the many ideas and suggestions contributed to this meeting that will help to build an even more effective Safe Transit Program."

# INDUSTRIAL PACKAGING MEN DISCUSS CUSHIONING AT JOINT-INDUSTRY CONFERENCE

More than 250 industrial and commercial packaging experts attended a two-day Joint-Industry Conference on "Cushioning in Packing" held at the Rackham Memorial Building, in Detroit, December 7-8.

Sponsored jointly by the Materials Management Center of Wayne University and General Motors Corp. preservation-packing committee, the program included 24 technical papers. The papers for the first day's sessions dealt with cushioning principles, techniques, and test methods. The remainder of the papers for the second day's sessions discussed cushioning materials and their applications.

A more detailed report of this meeting will appear in the Safe Transit Section of February finish.



### EXCLUSIVE TIGHT CORNER HINGE

stands up under scientific laboratory testing!

• B-G CRATES and PALLET BOXES assure you the utmost in STRENGTH and SAFETY in the shipping and storage of your products.

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- B-G Containers are SCIENTIFICAL-LY ENGINEERED and TESTED in our new, modern laboratory, APPROVED by the NATIONAL SAFE TRANSIT COMMITTEE.
- B-G Unique TIGHT CORNER feature makes possible a sturdy, collapsible hinged container assuring GREATEST

ECONOMY in your shipping, handling and storage problems.

- B-G Tight Corner Containers are IN-DIVIDUALLY ENGINEERED to fit your product.
- B-G invites your inquiries for further information. Sales engineer will call upon request.
- B-G offers without obligation the benefits of 30 YEARS EXPERIENCE in DE-VELOPING BETTER, STRONGER and more EFFICIENT Shipping and Storage CONTAINERS.



The collapsible crate with the exclusive 8-G Tight-Corner Hinge. Offers unusual rigidity and strength, yet light in weight. Easily assembled. Nail holes pre-drilled. Made up in 3 parts. Shipped collapsed.





MILLS:



















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President, United States Steel Corporation

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Mr. Hood and his associates may well be proud of the Steel Corporation's Payroll Savings figures:

- 144,000 men and women of U. S. Steel are enrolled in the Payroll Savings Plan—an over-all employee participation of 52%—excellent for a company as large as U. S. Steel.
- the average monthly investment of a U. S. Steel Payroll Saver is \$20.79.
- every month, these 144,000 employees invest \$2,993,760 in personal security—and America's economic stability.
- in some U. S. Steel plants and subsidiaries employee participation runs as high as 80%.

Nearly eight million men and women, in forty-five

thousand companies, large and small, are building personal security and contributing to national economic stability by their \$160,000,000 monthly investment in U. S. Savings Bonds. These Payroll Savers, with their \$25 and \$50 Bonds, are major shareholders in a huge recervoir of future purchasing power—the \$35.5 billion, cash value of Series E Bonds outstanding.

What is the employee participation in your Payroll Savings Plan? The average monthly deduction? How many employees have been added to your Payroll Savings Plan in the last year? Call for the figures and study them. Then, phone, wire or write to Savings Bond Division, U. S. Treasury Department, Washington Building, Washington, D. C. Your State Director will be glad to show you how easy it is to raise employee participation in your plan to 60%, 70%, or even better.

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OCUS your selling firepower. finish blankets the multi-billion dollar appliand fabricated metal products field. le plants use as much as 6 carloads packaging materials a day, as many as industrial trucks and from 5 to 20 miles conveyors.

the editorial spearhead for the National the Transit Program, the Safe Transit secon of finish provides a perfect editorial adground for the advertising of packing materials and materials handling vipment for the packaging, shipping d handling of home appliances and finished metal products.

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day of umbrella selling is over. Now the time to key your advertising and ing to the KEY MEN and INDUSTRIES buy and use your product or equipnt in large volume.

These suppliers of packaging materials and materials handling equipment are reaching the appliance and metal products manufacturing field through the Safe Transit section of finish.

**Acme Steel Company** American Box Board Co. Anchor Steel and Conveyor

Co.

Arno Adhesive Tapes, Inc. **Atlas Plywood Corporation** 

Bigelow-Garvey Lumber Co. Car Blocking, Inc.

Central States Paper & Bag Co., Inc.

Chicago Mill and Lumber Co.

**Chippewa Paper Products** Co.

**Container Corporation of** America

Cornell Paperboard Products. Co.

Gaylord Container Corp.

General Box Company

The Impact Register Co.

International Paper Co.

International Staple & Machine Co.

Kieckhefer Box and Lumber Co.

Kimberly-Clark Corporation

L.A.B. Corporation

**Link-Belt Company** 

Menasha Wooden Ware Corp.

Minnesota Mining & Mfg. Co.

Rathborne, Hair & Ridgway Box Co.

Richards-Wilcox Mfg. Co.

Sackner Products, Inc.

**Sherman Paper Products** 

Signode Steel Strapping Co.

Watkins Container Mfrs. Assn.

Weyerhaeuser Sales Co.

Wirebound Box Mfrs. Assn.

CCA

Appliance AND etal Products MANUFACTURING



# Acme Steel Strapping Insures S.A. (Safe Arrival)

and builds good will for Admiral Corporation



QUALITY CONTROL of Admiral television receivers extends beyond the assembly lines and into the shipping department where Acme Steel strapping is used to insure safe arrival of TV sets in the hands of distributors,

Admiral Corporation, Chicago, "world's largest manufacturer of television receivers," changed its method of shipping TV sets three years ago and 1) eliminated previously heavy damage in transit losses; 2) gained a tremendous amount of good will with its distributor organization.

Up until 1950, Admiral TV sets were placed in shipping cartons and loaded solidly into freight cars. Frequently the sensitive electronic tubes and complex wiring systems in the sets were damaged en route to distributors.

Then Admiral called in Acme Steel shipping

specialists to analyze the problem and help cut this loss. W. J. Curtis, traffic manager, tells what happened:

"Since we started using Acme Steel Strapping at our Chicago plant as a shipping safeguard three years ago, we have not had a single TV set damaged in transit which was attributable to improper loading or strapping failure."

Acme Steel Strapping can insure Safe Arrival for *your* products. Write for details to Acme Steel Products Division, Dept.F-14. Acme Steel Company, 2807 Archer Avenue, Chicago 8, Ill.



STRAP IT ... STITCH IT ... SHIP IT ... SAFELY!



### SAFE TRANSIT NEWS

# SAFE SHIPPING National Safe Transit Committee

### NATIONAL SAFE TRANSIT COMMITTEE

DuPont Circle Building, 1346 Conn. Ave., N.W., Washington 6, D.C.

Safe Transit Companies Total 141 - The following names have been added to the roll of companies certified under the National Safe Transit Program.

Calcinator Corporation, Bay City Michigan
Westinghouse Electric Corporation, Metuchen, New Jersey
Westinghouse Electric Corporation, Columbus, Ohio
Shampaine Company, St. Louis, Missouri
Logan Engineering Co., Chicago, Illinois

Safe Transit Laboratories Total 26 - The 26th fully equipped Safe Transit Laboratory is Union Bag & Paper Corporation, Savannah, Georgia, This is the first Safe Transit Laboratory in the State of Georgia.

Railroad Men Applaud Safe Transit Program - R. F. Bisbee, Chairman of the NST Committee conducted an informal meeting on the National Safe Transit Program for railroad men at a Westinghouse Electric Corporation plant in Atlanta, Ga., on October 21. In attendance were railroad officials, yard crews, clerks and inspectors; also, representatives of the Southern Weighing and Inspection Bureau, and motor carriers operating in the South.

Following a presentation of the Safe Transit film, Mr. Bisbee pointed out that the Safe Transit label used by Certified Companies signifies that they are conforming to testing procedures prescribed by the Committee.

Mr. J. C. Anderson, Assistant to Manager, Southern Weighing and Inspection Bureau, said that he voiced the opinion of all railroad representatives in attendance that cooperation was the best approach to a solution of the damage problem, and heartily endorsed the efforts of the NST Committee. He also told of the increased activities of the railroads to minimize damage and explained that it was particularly fitting at that time to have such a meeting sponsored by the NST Committee coinciding with, and lending support to the October Program of the Assn. of American Railroads. October, he said, had been designated as "Careful Car Handling Month."

Talk Before National Freight Claim Council, ATA - R. P. Carr, Chairman of the NST Carrier Coordinating Div. was luncheon speaker on November 19 at a meeting of the National Freight Claim Council of American Trucking Assns. His talk included the origin of NST, the present organization, progress and future plans, functions of testing laboratories, and the reading of testimonials. A discussion period following indicated the strong interest of the group and its desire to give the Program continuing cooperation.

Safe Transit Kit - The NST Committee has made up a bright red portfolio that contains a variety of information on the National Safe Transit Program. The  $10\frac{1}{2} \times 13\frac{1}{2}$  folder includes copies of the booklets, "Test Procedures," and "Safe Transit...A Must for Home Appliances," which describes methods for loading, bracing, blocking, and unloading. The kit was designed as a promotion and public relations aid for participants in the Program and those interested in certification. Copies are available through the Washington Office of the Committee at \$1.00 each.

finish JANUARY . 1954

inish

### Pre-shipment testing of packaged products

(Continued from Page ST-7)

### Verification tests before production

Before any new product or model is placed in production at Westinghouse, it undergoes verification tests which include the NST tests, followed by exhaustive performance and life tests. This provides the data for correction to the product itself, in most cases in early design models.

A few typical examples of problems discovered are:

1. Chippage of the electric range oven door at an emboss point. It was found by a slight modification of the emboss contour that chippage was eliminated.

2. Electric iron handle breakage. Slight modification of the mold in the manufacture of the iron handle resulted in a more stable design, eliminating breakage at a reduced packing cost.

3. Electric motor dislodged from its mounting bracket during National Safe Transit tests. It was revealed that the vibration plus the subsequent shock caused the motor to fall out of the mounting bracket, rendering the appliance inoperative as it would have been received by the customer. The design of the mounting bracket was changed to eliminate this hazard. Had it not been for National Safe Transit tests, this product could easily have gone into production with this difficulty unnoticed until thousands had been received in the field by customers.

From the foregoing it may readily be seen how the National Safe Transit tests provide an invaluable tool to the engineer in designing a product so that it will arrive safely in the customer's home and render satisfactory performance.

As a phase of quality control, these NST tests provide the one effective means to properly evaluate the overall quality of the product as it reaches the customer.

### What some users say

I could list hundreds of experiences of other companies who are using NST tests. Here are two typical reports:

#### **Editor's Note:**

The author, a technical con-sultant for finish, presented a paper on the subject of this article at the last Annual Convention of the American Society vention of the American Society for Quality Control in Philadel-phia on May 28, 1953. At this convention, there were over 2600 representatives of industry, laboratories, etc., from all over the United States.

Mr. Mason E. Wescott, of Rutgers University, chairman of the editorial board of the Society, has indicated that the Society board feels that this subject is vital enough to industry that it should receive wide editorial coverage.

Scores of manufacturers are using the NST Pre-Shipment testing program for improving testing program for improving packaging and shipping practices, and reducing in-transit damage. As Mr. Bisbee points out, this same program can serve as an invaluable tool for Product Quality Control where the equipment is available for daily use.

Day & Night Division, Affiliated Gas Equipment, Inc., Monrovia, Cal., V. R. Mottinger, chief process engineer - " . . . we feel that the National Safe Transit Program is proving of considerable benefit to our company to improve quality. It has been most interesting to find that there are some inherent weaknesses in our appliances which are showing up in these tests, and which we have failed to recognize through the usual medium of customer complaint. We anticipate producing a better product as a result of the use of this program."

Package Research Laboratory, Rockaway, N.J., Earl R. Stivers, director - "As an NST-certified laboratory, we have had the occasion to make many National Safe Transit tests. The interesting thing about these tests is that frequently they uncover weaknesses in the product which is being packaged. We had one article which disintegrated after only 30 seconds on the vibration tester. The manufacturer was so impressed with the possibilities of this test that he stopped production on that particular item and instructed his engineers to test all new products on the vibrator before going into manufacture."

### Quality, losses, costs and sales

I have attempted in the foregoing to give you proof and facts of actual experience in applying the National Safe Transit technique to quality control to convince all certified manufacturers of the importance of using this invaluable tool for quality control as well as for prevention of intransit damage.

Other benefits of NST testing:

1. A Tool for Reducing In-Transit Losses - To assure in advance that the product will stand normal handling and transportation.

2. A Tool for Reducing Costs -By having a definite standard for preshipment tests, it becomes a positive tool in reducing the costs of safe

packaging.

3. A Sales Tool - The program is a definite sales advantage in showing the customer that the shipper is doing everything possible to save him trouble and expense by reducing damaged goods.

Forgetting all- of the benefits but quality control, I can safely say that if the manufacturer will apply the plan as suggested in this article, it will not only be a means of cost savings but it will create a benefit that cannot be purchased in dollarsa higher quality product. This means building better customer relations, and reducing repairs and adjustments in the field.

I wish to again emphasize that the only way these benefits can be realized is to religiously follow the National Safe Transit Pre-Shipping tests daily.

### CERTIFICATION FOR SHAMPAINE, LOGAN ENGR., 2 WESTINGHOUSE PLANTS, UNION BAG & PAPER

Latest certifications under the National Safe Transit Program include Shampaine Co., St. Louis; Logan Engineering Co., Chicago; and Westinghouse Electric Corp., Metuchen, N.J., and Columbus, Ohio.

The latest fully-equipped Safe Transit Laboratory is Union Bag & Paper Corp., Savannah, Georgia.



# Not when you use KIMPAK\* 301!

New KIMPAK 301 is the practical solution to appliance surface scratching and other marring damage. KIMPAK 301's ability to shield the fine finish from abrasive high spots on the inner walls of cartons and blocking and bracing members of crates makes it the ideal protective agent in an appliance package. And KIMPAK 301 costs no more than ordinary materials. It is specially designed to prevent the three major causes of scratching:

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1. Abrasiveness of the inner spacers. Kimpak 301 provides a scratch-free, non-disintegrating, compressible barrier between inner spacers and the appliance finish. Its conformability ensures a snug package.

2. Dust, dirt, cinders that sift into the container. The combination of high creping and porous structure—exclusive with KIMPAK—traps dirt, grit or cinders, which may lodge between the packaging material and the surface.

3. Abrasive action of harsh packaging materials. Kimpak 301 is soft and non-abrasive . . . free from wood splinters, dirt and other abrasive materials. No lumps, hard glue spots or etiff wrighter. or stiff wrinkles.

Scratching is but one of many problems encountered in appliance packaging. These problems are solved with KIMPAK 301. For more details, contact the KIMPAK distributor in your area, or mail coupon below.

### SPECIFY KIMPAK 301 TO SOLVE THESE INTERIOR PACKAGING PROBLEMS:

Scratching Pressure-marking Staining Corrosion Conformability Ease of handling Appearance Disintegration

Whatever your protective interior packaging requirements, there is a Kimpak specification that does the job . . . better!



A Product of Kimberly-Clark

KIMBERLY-CLARK CORPORATION Neenah, Wisconsin We would like to learn how new Kimpak 301 can provide better protection at lower cost for our products. Please send complete information. Firm Name .... Street Address..... City Zone State

Dept. F-14

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SALES & CUSTOMER SERVICE 360 N. MICHIGAN AVE., CHICAGO 1, ILL. 6 E. 39th St., New York 16, N. Y. (Bob Weston)

"I saw your ad in finish"

#### FOR SALE

Two reconditioned Sparkler filters for acid plating solutions. 400 and 800 gallons per hour.

### H. N. CHRISTENSEN

#4 Burr Oak St., N.E. Grand Rapids, Michigan Phone Glendale 4-2554

### G-E MAN ELECTED PRESIDENT OF MATERIAL HANDLING INST.

At the annual meeting of The Material Handling Institute, held re-



CHARLES B. ELLEDGE

cently in New York City, Charles B. Elledge, of General Electric Co., was elected president for 1954. Elledge succeeds Howard M. Palmer, of Lewis-Shepard Products, Inc., Watertown, Mass., who is now a director of the Institute.

To help Elledge administer the educational work and services to the industry of this growing trade association (over one and one-quarter billion dollars of production per year), Walter E. Schirmer, vice president of Clark Equipment Co., Buchanan, Mich., and Edward W. McCaul, secretary of Jervis B. Webb Co., Detroit, were elected first and second vice presidents, respectively.

Elledge is currently manager of materials handling industrial sales for G-E at Schenectady, N. Y.



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# this lifetime finish helps spark sales

Now that buyers of appliances are becoming "shoppers" again, you can give your products a big lift in the race for sales by designing with Porcelain Enamel.

### CUSTOMERS COME BACK



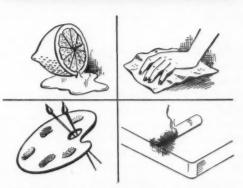
This beautiful finish that "lasts a lifetime" offers your customers longest service at less cost. It is a big reason why Porcelain Enamel attracts so many customers for all kinds of products.

### STAND-OUT FINISH



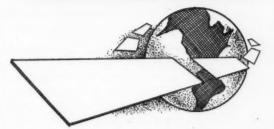
A Porcelain Enameled finish on your appliances and other household equipment offers so many unusual advantages that it stands out as a sales-aid in comparison with other finishes.

### CHECK THESE FEATURES



Resists fruit acids and commonly used chemicals. Cleans as easily as a china plate. Colors never "fade" or lose original luster. Forgotten cigarettes can't harm its hard glossy surface.

### "WORLD'S STANDARD"

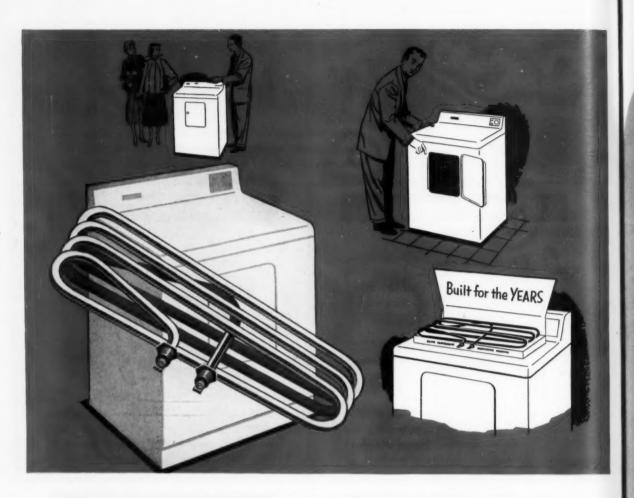


The metal beneath the Porcelain Enamel surface must have excellent bonding qualities, flatness, and uniform characteristics. That is why more manufacturers have used more Armco Enameling Iron over a longer period than any other enameling base. That is why, too, it is known as the "World's Standard Enameling Iron."

# ARMCO STEEL CORPORATION

3573 Curtis Street, Middletown, Ohio . Export: The Armco International Corporation





### For FASTER, EASIER SELLING of Clothes Dryers

equip with TK Rod-type heating units

That competitive advantage you are seeking this next year could well be the use of TK Rod-type heating elements. Granted, they'll probably cost more—and this fact may deter some manufacturers from adopting them. But think of the sales pluses you get—for as little as 40 to 50 cents added to the cost of your product.

Your dealers (and their customers, too) will sense the extra value at a glance. Ruggedly built, compact, free from the hazards of lint, moisture and corrosion, TK Rod-type units provide the ultimate in electric heating. Best of all, they will last longer, years longer—an important point when householders are investing hundreds of dollars in an appliance.

### TK Units for DISHWASHERS, Too!

Sturdily built for long service, quickly responsive in operation, TK Immersion Units help sell your product . . . help to keep it sold thereafter. Write today for further details, also for any help you may need in designing the heating element.





FERROD MFG. COMPANY

a Subsidiary of Ferro Corporation

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#### MONTHLY TRADE PUBLICATION

Established January 1944 Published by

#### DANA CHASE PUBLICATIONS

360 North Michigan Avenue Chicago 1 Telephone CEntral 6-1229

A trade publication devoted to the interests of the A trade publication devoted to the interests of the metal products manufacturing industry with special editorial attention to home appliances. Includes technical and practical information on plant facilities and manufacturing problems from raw metal to safe delivery of the finished product, with special emphasis on fabrication, metal preparation, metal finishing, assembly, and packaging and shipping.

Free controlled circulation to management, purchasing, engineering and key plant personnel in metal product manufacturing plants. To others, subscription price is \$5.00 per year, domestic. To all other countries \$8.00 per year (U.S. funds).

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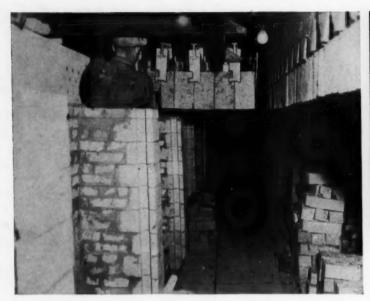
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METAL PRODUCTS MANUFACTURING OM RAW METAL TO FINISHED PRODUCT





Huyck Masonry service is complete . . . includes all necessary materials. At left is a continuous furnace under construction (note special tongue and groove bricks), and above, a view of the completed masonry.

# FIREBRICK MASONRY is no job for amateurs!

HUYCK BUILDS, REBUILDS, REPAIRS ALL TYPES OF:

ENAMELING FURNACES . . . FRIT SMELTERS . . . ALUMINUM, BRASS, LEAD SMELTERS . . . FORGE FURNACES . . . HEAT TREATING FURNACES.

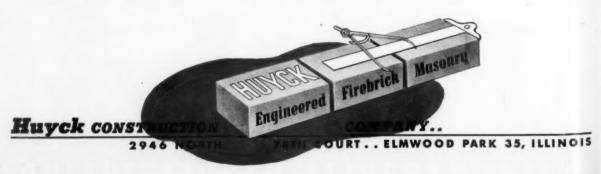
HUYCK LINES AND RELINES MILLS

HUYCK MEANS MASONRY

The pressure of keen competition in modern day business leaves no room for waste. That's why industry gets its jobs done by men who know how to do them best.

Firebrick masonry is a typical example of a specialized type of work. It requires the skill of experienced masons. And Huyck masons have that skill. For over a quarter of a century, Huyck has been doing an outstanding job in engineering masonry work for industry. Enameling furnaces, heat treating, forging and annealing furnaces, mill lining work, and smelters are just a few of the jobs we've done. The fact is that, no matter what type of masonry construction is needed, Huyck is equipped to do the job quickly, efficiently and reasonably.

HUYCK MASONRY IS GUARANTEED TO GIVE YOU BETTER PERFORMANCE AND LONGER LIFE



# Ceramic Coated Parts

- Mass produced



These parts are being processed with Solaramic coatings in the nation's first conveyorized mass production facility for applying high temperature coatings to alloy steel components. The drop rods, on which the parts are hung, are made of strong, heat-resisting Incoloy.

### On Incoloy Drop Rods at 1800°F

The nation's first conveyorized, mass production facility for applying high temperature ceramic coatings to alloy steel parts is now in operation at Solar Aircraft Company's San Diego plant.

The parts to be coated are first sand blasted. Next they are sprayed on the inside with a Solaramic coating, hung on Incoloy® drop rods on the assembly line and sprayed on the outside.

Then the conveyor line travels at two feet a minute through gas-fired direct flow dryers operating at 150° F. After drying, the parts enter the gas-fired furnace where the coating is fired at a temperature of approximately 1800° F. through a 15-foot zone.

And here's where Incoloy shows its stuff!

Day after day, burning tools of this

heat-resisting Inco Nickel Alloy go through the furnace and effectively resist the corrosive attack of the combustion gases at the 1800° temperature. And, moreover, they resist scaling, so spoilage is kept to a minimum.

Like Solar Aircraft Company, you, too, may find Incoloy the right material for your burning tools and fixtures.

Because of its excellent strength (up to 1850° F.) and corrosion resistance, Incoloy can be made into lightweight equipment. This newest member of the Inco family is readily fabricated into burning tools of all types. It is both workable and weldable for maximum flexibility in efficient design.

If you would like to learn more about Incoloy, write for your copy of "Progress Report on Incoloy."

The International Nickel Company, Inc.



Incoloy ... for Heat-Resisting Applications

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# AMERICAN CHEMICAL PAINT COMPANY AMBLER TO PENNA.

# Technical Service Data Sheet Subject: INDEX OF ACP CHEMICALS FOR METAL PRESERVATION AND PAINT PROTECTION

ETAL	OPERATION	ACP CHEMICAL
АСИМИНИМ	Cleaning	"DEOXIDINE" "DURIDINE"
	Preparation for Painting	"ACP RIDOLINES AND RIDOSOLS"  "ALODINE"  "DURIDINE"
		"DEOXIDINE"
	Protection from Corrosion	"ALODINE"
	Brightening	"ACP BRIGHT DIP"  "DEOXIDINE"
	Cleaning	"DUBIDINE"
BRASS		"ACP RIDOLINES AND RIDOSOLS" "DEOXIDINE"
60	Cleaning for Painting	"CUPROTEK
-	Corrosion Prevention	"CUPROTEK" "FLOSOL"
	Soldering Flux	"FLOSOL"
300	Brightening	"ACP BRIGHT DIP"
26	Cleaning	"DEOXIDINE"
11		"DURIDINE"
× ×	Cleaning for Painting	"ACP RIDOLINES AND RIDOSOLS" "DEOXIDINE"
PER, BERYLLIUM, COPPER ALLOYS		CUPRUIEK
P. P.	Coating Steel with Copper Corrosion Prevention	"CUPRODINE" "CUPROTEK"
m 8	Scale Modification	"RIDOXINE"
COPPER,	Soldering Flux	"FLOSOL"
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ANIZED IRON, AND CADMIUM	Cleaning	"DURIDINE" "ACP RIDOLINES AND RIDOSOLS"
94	Carrosian Proofing	"ZINODINE"
E	Paint Banding	"ZINODINE"
23	Phosphate Coating, in Preparation for	
GALVANIZED IRON, ZINC, AND CADMIUM	Painting Soldering Flux	"LITHOFORM" "FLOSOL"
-	Chromate Coating, in Preparation for	"CROMODINE"
	Painting Cleaning	"ACP RIDOLINES AND RIDOSOLS"
	Cleaning for Painting	"DEOXIDINE"
	Continue of Continue	"CUPRODINE"
	Coating with Copper Drawing and Extrusion	"GRANODRAW"
	Paint Bonding	"CROMODINE"
-4		"GRANODINE"
W.		"PERMADINE"
ST		"THERMOIL-GRANODINE"
9	Paint Stripping	"CAUSTIC SODA AND SOLVENT NO. 3"
ROW AND STEEL	Phosphate Coating, in Preparation for Painting	"DURIDINE"
0		"GRANODINE"
=		"PERMADINE"
	Phosphate Coating, to Protect Friction	"THERMOIL-GRANODINE"
	Surfaces	"THERMOIL-GRANODINE"
	Pickling with Inhibited Acids	"RODINE"
	Rust Prevention for Unpainted Iron Rust Proofing	"PEROLINE" "PERMADINE"
	1	"THERMOIL-GRANODINE"
	Rust Removal — Brush, Dip, or Spray Soldering Flux	"THERMOIL-GRANODINE"  "DEOXIDINE"  "FLOSOL"
-	Soldering Plox	FLOGOL
MAGNESIUM	Cleaning	"DURIDINE" "ACP RIDOLINES AND RIDOSOLS"
MAGN	Pickling	"RODINE (M-200)"
ESS.	Cleaning	"DEOXIDINE"
STAINLES	Coating with Capper Pickle Polishing	"CUPRODINE"
1 3 E	Soldering Flux	"RODINE" "FLOSOL"
15	Total Indiana	



WRITE FOR DESCRIPTIVE FOLDERS ON THE ABOVE CHEMICALS AND FOR INFORMATION ON YOUR OWN METAL PROTECTION PROBLEMS



### MEETINGS

### **ENAMELERS CLUB MEETINGS**

Central District Enamelers Club, Mansfield Leland Hotel, Mansfield, Ohio, February 5.

Eastern Enamelers Club, Hotel Sylvania, Philadelphia, February 27. Midwest Enamelers Club, LaSalle Hotel, Chicago, March 20.

### ELECTRIC SIGN ASSN.

National Electric Sign Association, annual meeting, Conrad Hilton Hotel, Chicago, February 28 to March 3.

# PRESSED METAL INSTITUTE SPRING TECHNICAL MEETING

Pressed Metal Institute, annual spring technical meeting, Hotel Carter, Cleveland, March 17-19.

### LUBRICATION ENGINEERS

American Society of Lubrication Engineers, annual meeting and exhibit, Cincinnati, April 5-7.

### TOOL ENGINEERS EXPOSITION

American Society of Tool Engineers, industrial exposition, Philadelphia's Convention Center, April 26-30.

### WELDING EXPOSITION

American Welding Society, spring technical meeting and welding and allied industry exposition, Memorial Auditorium, Buffalo, May 4-7.

### LP-GAS CONVENTION

Liquefied Petroleum Gas Association, convention and trade show, Conrad Hilton Hotel, Chicago, May 9-12.

### GAS APPLIANCE MFRS. ASSN.

Gas Appliance Manufacturers Association, annual meeting, Drake Hotel, Chicago, May 19-21.

How are Your Baking or Drying Costs?



... betters conventional

methods by

30% 10 70%



It's a story that has been told and proved over and over again — 30% to 70% savings in costs and a better product also. In a Burdett "Radiant Heat" Oven the temperature remains uniform from top to bottom — an even bake at all times. Combustion is more complete than in any other type of oven — therefore, important fuel savings. Run any combination of colors through simultane-

ously with perfect results. A Burdett "Radiant Heat" System can be installed in your present oven or be engineered as a completely new finishing system. Send your paints and samples of your products — or, bring them to our laboratories for proof of these and many other advantages before you sign on the dotted line. A test run will convince you — do it now! No obligation.



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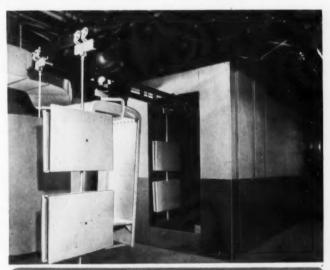
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Photos of Sub-Zero Freezer cabinets drying the Burdett way in 20 min. at 325° F. Higher gloss than usual and a harder finish is also claimed.



BURDET T

3401 West Madison Street, Chicago 24, Illinois

Detroit

Philadelphia

New York

Cleveland

Dallas

Manufacturers of OVENS, "RADIANT HEAT" SYSTEMS, HEATERS, WASHERS, SPRAY BOOTHS AND AIR MAKE-UP UNITS

# How to get your production

# "off the ground"



As luggage frames dry after gluing, they are stored and carried to next station. Note how "safety net" protects workers under one of the two 850-ft. Link-Belt assembly conveyors.



#### Samsonite luggage is efficiently stored and processed on LINK-BELT Overhead Trolley Conveyors

Like so many modern factories, Shwayder Bros. found a way to step up production with no extra floor space at their Denver (Colo.) luggage plant. The answer: Link-Belt Overhead Trolley Conveyors.

By putting ceilings to work, you, too, can achieve more efficient production regardless of your plant's physical layout. Link-Belt Overhead Trolley Conveyors travel around obstructions . . . from floor to floor . . . building to building. They remain high in the air where headroom is required . . . dip floorward to bring the load down to working level.

Equally important, floor space now needed for aisles or storage can be used for machines. Valuable manpower is not wasted to carry, lift or shove.

If your materials move along a fixed route, there's a good chance Link-Belt Overhead Trolley Conveyors can cut your production costs. A conveying expert in the Link-Belt office near you will be glad to analyze your requirements. Why not call him today?

LINK-B-BELT

OVERHEAD TROLLEY CONVEYORS

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities, Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs.

# THE finish spotlight



You're not seeing double: This picture illustrates, with the use of a double exposure, how the new two-way opening door on Philco's new refrigerator actually operates, swinging either to right or left. Door mechanism, with distinctive center-mounted V-shaped handle, releases the hinge arrangement on the side which is to be opened and keeps the hinges on the opposite side tightly latched.

Perfect Parts... Made to Order

# ALUMINUM

# SHELVING, PANS & TRAY REYNOLDS



Color-Anodized Parts And Trim Provide Design Flexibility . . . Offer An Economical Way To Change Appearance Of New Models At Minimum Cost

Color-anodized parts like these shelves, crisper pans and utility door trays produced by Reynolds benefit refrigerator manufacturers both in greater sales appeal and in lower costs.

For instance, there's no substitute for the serviceability of rustproof, stainproof, light yet strong aluminum shelving . . color-anodized in blue, gold and other customer-pleasing colors. Likewise, attractive color-anodized crisper pans and

utility door trays offer crackproof, wear-resisted durability . . . won't rust or stain . . . stand under years of hot water washings with no me for replacement.

Parts like these—along with color-anodin interior and exterior trim—also offer defin savings to manufacturers by permitting desi flexibility and economical style and color cham in new models.

### Reynolds Aluminum Fabricating Service Provides Complete Production Facilities . . . Offers Help On Your Design And Engineering Problems

Reynolds skill, experience, facilities, quality control from mine to finished product, expert assistance on design and engineering problems — all these benefits are available to you on your present needs or on development work for future models.

For full details, contact your nearest Reyno office listed under "Aluminum" in your classiful telephone directory, or write direct to Reyno Aluminum Fabricating Service, 2058 South Ni Street, Louisville 1, Kentucky.





# REYNOLDS ALUMINI

SLANKING . EMBOSSING . STAMPING . DRAWING . DIVETING . FO



ALUMINUM-

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	Strength	Corresion Proof	Rapid Heat Conductivity	Attractive Appearance	Economy
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nodized		V	V		V
trinless hel	V	V		V	
rdnary hel	V				V
be sinovior	V				V

Write for your free copy of the new 16-page "Appliance Parts" brochure

> SEE "Mister Peepers" Sundays, NBC-TV. Consult local listings for time and station.

#### RELY ON REYNOLDS FOR THESE PARTS, TOO!

#### REFRIGERATOR EVAPORATORS

Reynolds Aluminum embossed and anodized refrigerator evaporators offer unequalled economy and efficiency in rapid heat conduction.

#### FREEZER LINER PANELS

Reynolds Aluminum embossed, anodized home freezer liner panels are shipped flat with tubing brazed in position for fast assembly.

#### VERTICAL FREEZER SHELVING

Reynolds Aluminum vertical home freezer shelves are durable, attractive, and made of just the right alloy especially selected to insure maximum rigidity. Available in plain or anodized finishes.



LI SHAPING • TUBE BENDING • WELDING • BRAZING • FINISHING

finish FEBRUARY . 1954



Ainsworth MULT-A-FRAME Channels are Painted in MAHON EQUIPMENT!

When the MULT-A-FRAME Division of Ainsworth Manufacturing Corporation was

confronted with a finishing problem, they turned to Mahon for the solution. The product is a box channel 20 ft. long with only a 1/2" slot in one side—these are cleaned, rust proofed and painted outside and inside. Two hundred channels are finished per hour. Thousands of Fittings, Concrete Inserts and other MULT-A-FRAME parts and accessories are also finished on the same line. The finishing equipment extends from a pit in the first floor to the second floor ceiling. Oven Heating Units, Recirculating Fans and Exhaust Fans are located on the third floor. Automatic loaders and unloaders, with ramp conveyors from the first floor, load and unload the main conveyor which is located 27'-5" above the first floor. This is another Complete Mahon Finishing System designed and built by Mahon to do a specific job efficiently and economically. If you have a finishing problem, or are contemplating new finishing equipment, you will find that Mahon engineers are better qualified to advise you on both methods and equipment requirements . . . better qualified to do the all-important planning and engineering of equipment—which is the key to fine finishes at minimum cost. You will also find that Mahon equipment is built better for more economical operation over a longer period of time. Mahon's background history in this highly specialized field covers thousands of Complete Finishing Systems including Dip, Flow Coating and Spray Equipment for every conceivable product painted on a production basis. See Sweet's Plant Engineering File, or write for Catalog A-654.

THER.C.MAHONCOMPANY

HOME OFFICE and PLANT, Detroit 34, Mich. • WESTERN SALES DIVISION, Chicago 4, III.

Engineers and Manufacturers of Complete Finishing Systems—including Metal Cleaning, Pickling, and Rust Proofing Equipment, Hydro-Filter Spray Booths, Dip and Flow Coaters, Filtered Air Supply Systems, and Drying and Baking Ovens, Cooling Tunnels, Heat Treating and Quenching Equipment for Aluminum and Magnesium, and other units of Special Production Equipment.

# MAHON



A couple of scientists worked for years in an effort to produce the perfect dog food. Finally, after exhaustive research, they announced that they had achieved their purpose, THE perfect dog food.

There was, however, one important hitch . . . the DOGS didn't like it.

#### Now, let's get on the serious side

You have to know that we fully recognize the tremendous importance of the work being done by our own and the many other very capable ceramic engineers.

Beyond question, Ing-Rich could not produce its highly regarded FRITS without the valuable work being done by our very competent staff of ceramic research engineers . . . but . . . there is also to consider that

#### ING-RICH FRIT

is tried on the Dog and . . . he likes it!

It should be important to you that Ing-Rich Frit is plant tested frit. Operating, as we do, one of the largest job enameling plants in the country, our day in and day out experience in using our own Frits gives us that important PLUS . . . the "know how" that comes from practical experience. Bear in mind that this is of tremendous value to our ceramic engineers. They "try it on the dog" and our outstanding reputation in the job enameling field proves that "the dog likes it"—and also should prove to you the tremendous advantages of Ing-Rich Plant Tested Frits.

INGRAM-RICHARDSON, INC.
OFFICES, LABORATORY AND PLANT
FRANKFORT, INDIANA



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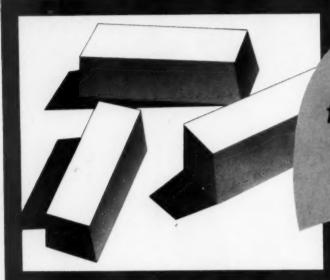
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Why Switch to MCDANEL

Super High Density Mill

Lining Brick

MCDanel Super High Density Mill Linings are installed in the same way that the conventional Porcelain Linings are installed —and just as simply. But—and this should interest you if production costs are important—McDanel Super High Density Mill Linings will outlast two and a half regular porcelain linings—saving about 44% in the cost of the lining bricks—a great amount of down time and relining expense.

Get full information from your jobber

or write direct.

#### Other McDANEL Products

Laboratory Grinding Jars and Jar Mills Special Shapes . . . Mill Head Assemblies Tank and Dryer Linings Grinding Balls (Porcelain or High Density) BECAUSE YOU GET...

MORE PRODUCTION
LONGER LIFE
LESS CONTAMINATION
LESS DOWN TIME
GREATER ECONOMY

WRITE FOR CATALOG



McDANEL REFRACTORY PORCELAIN CO. BEAVER FALLS, PENNA.



### tinish suggestion BOX

# Using air-inflated grinding wheels for metal finishing range parts

by Ralph Arras . WESTINGHOUSE ELECTRIC CORP., MANSFIELD, OHIO



Operator at Westinghouse Mansfield plant is using portable pneumatic grinder on the metal finishing line for range platforms. Experience information is included in this article.

NE of our first applications for the pneumatic portable grinder was in connection with the metal finishing of range platforms. In our particular design, these platforms are drawn in one piece — that is, the back splasher and the cooking top combined. At the two back corners there is an extreme draw which has a tendency to wrinkle somewhat and there is also sometimes a die block mark at the front corners which requires metal finishing.

We have been using the pneumatic portable grinder for some eight or ten months, and we will outline our experience to date.

When comparing this new method with the old method of setting up with emery and glue, there is considerable savings. We find that this wheel has more durability than our previous soft wheel setup. In other words, the new belt-type pneumatic grinding band will give at least three times more service per band than the old type soft wheel.

There is also the factor that with the old system a daily operation of setting up the wheels was required, and it was also necessary to carry an extra supply on hand.

On the old type wheels set up with emery and glue, there is sometimes a hazard of parts flying and striking workmen in the area. Guarding against injuries such as face cuts and eye injuries is always a problem. The pneumatic belt type grinder eliminates this hazard.

While we believe there may be other factors which may present themselves later — particularly in relation to the operating costs — the comments presented here are based on our operations to date.

Source for further information on these air inflated grinding wheels may be obtained by writing to finish reader's service.

If you have an idea for the practical application of a process or equipment item which would benefit *finish* readers, your suggestion will be welcome.

# Have you tried them?

# "NU-FLAKE TWINS"

Now you can have, for still better Porcelain enameling, matched ground coats and cover coats...

Both made in FLAKE Form!

Both made by Ferro's NU-SMELT

process!



By combining all the advantages of Ferro Flake and Nu-Smelt Frits into (1) new ground coats and (2) new cover coats, Ferro can now offer the most workable and completely satisfactory combination of Porcelain enamel frits yet formulated.

#### **3-Way Protection**

Ferro's NU-FLAKE TWINS, used in combination, provide 3-way protection and quality guarantee for your entire enameling process.

ONE... The NU-FLAKE TWINS minimize all the ordinary "bugs" in your production line. Firing range is excellent; you get better drain, better adaptability to various grades of steel and types of processing equipment; no mill dust; uniform slip.

TWO... Thanks to the NU-FLAKE TWINS, your products have a tougher, more durable and more uniform finish than you ever thought possible.

Less hairlining, more uniform set characteristics, better color uniformity, fewer rejects.

THREE ... The NU-FLAKE TWINS were made to go together. Individual characteristics of both ground and cover coats complement one another to give you the most economical, practical and attractive Porcelain enamel finish your products ever had. Too, responsibility for both ground and cover coat operations is pinpointed for fast, efficient service.

Call or write today for full information and samples.



#### FERRO CORPORATION

Porcelain Enamel Division
4150 EAST 5616 STREET . CLEVELAND 5, OHIO



Pulsation Chamber. Just one example of a great variety of Danielson precision assemblies.





Air Shroud for air cooled engines. A typical Danielson spot welding assembly on automatic spot welders for low cost and speed production.

**Fabricated** steel cabinets of all sizes and description.



18 ga. steel one piece draw swivel chair base.

12" rule photographed with chair base to show comparative size.



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VARIETY

Quality
Products

Pictured here are a few of the many items we produce for satisfied customers. What we cannot picture is the high quality and service Danielson is equipped to give you ---- try us!

Write - 'phone - or wire us today!



. W. DANIELSON MANUFACTURING COMPANY

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• LEVOLOR-equipped venetian blinds feature an all-metal head and bottom-bar designed and engineered by Levolor Lorentzen, Inc.

Republic Electro Paintlok, the zinc-plated steel sheet that is chemically treated to take paints, lacquers and synthetic enamels... and to hold them for years... is one of the materials used for these reasons: 1) Electro Paintlok's resistance to corrosion; 2) Paint adheres better to Electro Paintlok; 3) Painted surfaces "resist chipping."

Here's proof of Electro Paintlok's ability to take and hold paint: Prior to fabricating the head and bottom-bar, the Electro Paintlok Sheets are roll painted and formed. The rolled shapes are then fed into machines called "Custom Makers" where they are cut to size, formed, pierced and lanced. Even under these severe fabricating operations the painted surface does not chip.

Get the complete story on Electro Paintlok for your painted or enameled steel products. Write for Booklet 525.

#### REPUBLIC STEEL CORPORATION

GENERAL OFFICES • CLEVELAND 1, OHIO Export Department: Chrysler Building, New York 17, N. Y.



Other Republic Products include Carbon and Alloy Steels—Pipe, Sheets, Strip, Plates, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing



#### The NATIONAL SAFE TRANSIT PROGRAM

— can serve your company in many ways. It should be studied by all key personnel, from top management to the packaging engineer. It can affect product design, production planning, quality control, as well as materials handling and packaging and shipping practices.

#### Mr. General Manager . . .

If your company is making a home appliance or any similar type of finished metal product that must be shipped by rail, truck or air to an ultimate user, you should know all about the National Safe Transit method of insuring safe arrival.

If your company is not now certified as a user of the NST pre-shipment testing program, then you are not doing everything you can to cut down shipping losses, improve your packing and shipping practices, reduce costs, and insure safe arrival of your products at destination.

#### Mr. Sales Manager . . .

Unless your company name appears on the published list of Safe Transit certified companies, you are not doing everything you can to assure distributors and dealers of your earnest desire to save them the grief of damage claims.

The Safe Transit label on the container of each of your packaged products is your best sales point to customers—the best proof that *your* company is doing everything possible to "deliver the goods" and deliver them safely and in saleable condition.

#### Mr. Packaging Engineer . . .

If you aren't conducting the standard pre-shipment tests of the National Safe Transit Committee, you are missing the golden opportunity to join the 140 leading producers of appliances and metal products who have joined hands in a voluntary cooperative program for the improvement of packaging and shipping practices and the reduction of in-transit losses.

The NST program is recognized by all types of carriers and by the country's leading container laboratories as the first successful standard test program applicable on a nationwide basis.

finish FEBRUARY . 1954

#### All executives and plant supervisors

To all executives or plant men responsible for the production and safe delivery of home appliances and similar products, we say:

You owe it to yourselves, to your companies, and to your customers to investigate the NST program. It affords:

#### 1. A tool for Quality Control . . . .

You can check the shipability of your *product* and check your product construction quality standards with the NST tests.

#### 2. A tool for Cost Reduction . . . .

You can determine the minimum cost for the packaged product that will deliver safely. You can eliminate "overpacking."

#### 3. A tool for Selling . . . .

You can build good will for your company and your products and reduce distributor and dealer complaints due to damaged merchandise.

#### 4. A check on Materials Handling . . . .

The NST program provides a tool for checking materials handling methods in your own plant and during shipment.

#### 5. A tool for Design Engineering . . . .

Design engineers can pre-check new designs and construction features before recommending the new features for production.

And, believe it or not, you need only conduct the simple tests in your own plant, or have them conducted by a certified laboratory to apply for certification.

No organization to join - no dues to pay.

If you don't have complete information on this voluntary, cooperative program, write to "finish Reader Service" at once for a free booklet outlining the test program and a list of certified manufacturers.

Save money — reduce dealer claims — and build good will for sales by joining the NST program.

Dana Chase

EDITOR AND PUBLISHER



The name Udylite on plating equipment is your guarantee of painstaking research, modern design and precision manufacture. It is your assurance, too, of never-ending service—your warranty far beyond any statement of guarantee.

But, in addition, highest quality plating supplies must be used with good equipment for best results. That's why Udylite plating supplies are so important to you. High quality . . . rigid control . . . is your assurance that Udylite plating supplies plus Udylite equipment give the finest results in the plating industry.

There is no better way of plating than the Udylite way. Put it to work for you. Let the Udylite Technical Man give you all the facts.

PIONEER OF A BETTER WAY IN PLATING



### **Assembly line operations** for the Admiral electric range

a photo story of the latest step in multi-million dollar Midwest Manufacturing range-refrigerator-freezer plant in Galesburg, Illinois — facilities total some 750,000 square feet, with six miles of conveyors

DDITIONAL construction at A Admiral Corporation's multimillion dollar range-refrigeratorfreezer plant, in Galesburg, Illinois, is virtually complete, according to John B. Huarisa, executive vice president. The facilities now have a total area of 750,000 sq. ft. and contain nearly six miles of conveyors.

A 35,000 sq. ft. porcelain department extension has doubled the capacity of the company's Midwest Manufacturing Corp. subsidiary, and is being operated on two shifts. The

ns-

plant has a porcelain capacity of 1,500 refrigerators and 400 ranges a day.

The fabricating area in the 126,000 sq. ft. range plant has been enlarged to include a press room and welding facilities which formerly were located in the main refrigerator building, Huarisa said. The refrigerator plant has been lengthened 50 feet and production lines have been extended. A new packaging area also has been set up.

A 60,000 sq. ft. corrugated steel

warehouse which was dismantled last spring after a 90,000 sq. ft. brick warehouse was constructed over it, has been set up next to the new range plant. In addition, a second enclosed inter-plant conveyor system has been built between the porcelain department and the range plant. Raw steel parts are carried over the 2,500-foot long conveyor, while finished parts are returned to the assembly lines.

A 100,000 gallon elevated water storage tank has been completed to service the plant's sprinkler system.





1. Sub-assembly of range body: We is putting the finishing touches to poor range body at the beginning of the assembly line in Admiral's new range place.

3. Installation of oven: After ins is applied, large oven is fitted in range body. Sealing strip already he placed around front flange of the

2. Application of insulation: Large sheets of insulation surround the walls of the oven in each Admiral range. Insulation assists in getting oven heat up to the proper temperature quickly, in addition to keeping the kitchen cool.



4. Setting range top in place: Next step in building a range is attaching the porcelain enamel top section to the partially completed body.







#### Editor's Note:

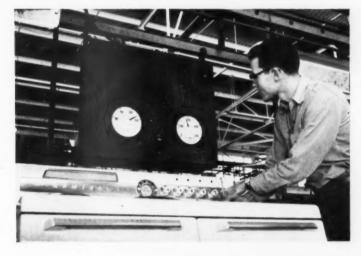
Editor's Note:

In the January 1953 issue of finish, a special 40-page section was devoted to "The Admiral Story", with emphasis on refrigerator production at the Midwest Manufacturing Corp. subsidiary, in Galesburg, Ill.

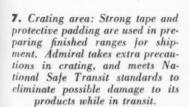
This photo story on assembly line operations for Admiral ranges at Galesburg represents the latest chapter in the story of Admiral's growing appliance lines.

5. "Spaghetti for cooking": While the pres. Spagnett for cooking: white the pre-liminary assembly work is being done on the range body, nimble-fingered women prepare the complex electrical wiring in the housing which contains the heating control units.

sting completed range: inspector at testing sta-is shown checking conto insure proper opera-tion of the range.



Materials handling shown in the Safe Pages ST-4 and ST-5. operations are Transit section,







FOR BETTER

# "Paint Adhesion

use

## MACCO MACHINE NO.71

a phosphate cleaner and rust inhibitor

> Illustration shows two sheets of steel, painted at the same time with the same paint and exposed for months to all kinds of weather. On the left is shown a surface which was cleaned and phosphatized with Macco M.C. No. 71. Note how clear and smooth it appears. On the right, a surface on which ordinary cleaner was used. Note pooling and cust history. . Note peeling and rust blisters.

### A MACCO CASE HISTORY\*

As in all fields today, purchasers of metal products are constantly demanding more and more in the quality of their paint finishes.

By far the most efficient and economical method of preparing metals for the finest By far the most efficient and economical method of preparing metals for the finest and most enduring paint job is by use of Macco M.C. No. 71. Laboratory and shop tests prove that, on steel, cast iron, aluminum or die cast, Macco M.C. No. 71 provides a correction-resistant, phosphate, coaring comparable in quality to that formally available. prove that, on steel, cast from artificial or the cast, macco M.C. 140. /1 provides a corrosion-resistant phosphate coating comparable in quality to that formerly available only through expective and alaborate methods of proportion. only through expensive and elaborate methods of preparation.

# TESTED ADVANTAGES OF MACCO M.C. No. 71 CLEANER

- Cleans oil, grease, etc. from metals.
- 3. Gives microscopic phosphate coating, greatly aiding in paint adhesion and corro-
- sion resistance. No special equipment required.
- 5. Never hardens in the drum.
- 6. Gives excellent protection against rust prior to painting.
- 8. Can be run in conventional one, two, or three stage washers, as well as in other 7. Assures best possible protection to painted surface.
  - Use Macco M.C. No. 71 Cleaner and Phosphate Coating and add immeasurable

\* Acrual case history, names, etc. can be had by writing today to quality to the finish of your product.

9210 SOUTH SANGAMON STREET . CHICAGO 20, ILLINOIS

### From raw material to finished product

Part II—a new era in the metalworking industry

by James M. Leake . PRESIDENT, THE LEAKE STAMPING COMPANY, MONROE, MICHIGAN; TECHNICAL CONSULTANT TO FINISH



Vast deposits of coal enhanced the possibilities for heat and power. Iron ore was found to exist in 5% of the earth's surface.

with its greatest concentrations far underground. Two more milestones in our path to this industrial age was in learning how to transform iron ore into steel and then roll this steel into sheets. These developments are of major importance for they led to a new era in the history of metalworking.

While no specific incident represents the beginning of the stamping business, it is generally agreed that its beginning was a hundred years ago, for that takes us back to the development of the punch press. The early models derived their pressure by using a screw type mechanism to amplify the power of man. Later machines made use of water power. Then came the rack type feeding mechanism, and finally the more modern crank press.

No metal in itself presents a glamorous picture until glorified in its final re-creation. Metalworking and finishing transforms raw metal into products having utility, durability and eye appeal. This miracle has made steel the most valuable form of iron, for it contributes more to our material welfare than all of the other metals combined. Just imagine what America would be like if the last vestige of steel vanished from our midst.

finish FEBRUARY . 1954

Roughly speaking, steel is an alloy of iron and carbon. Its hardness, strength, ductility and other properties may be controlled by varying the proportions of the elements and their subsequent heat treatment. When sufficient carbon is present, steel may be hardened by a sudden cool quench from high temperatures, or it may be softened by slow cooling from a high temperature. A hard surface may be imparted to steel over a soft core by adding carbon to the surface at high temperature before quenching.

Steel may be ductile that it may be drawn until it is a fraction of the diameter of a human hair or strong enough to lift several hundred tons with a steel bar only one inch square. Steel may be made hard enough that it can scratch glass or soft enough that it may be scratched with a pin. In deep drawing, steel undergoes a plastic reorientation of its fibres. If this work hardening results in crystallization, annealing will restore its original workability.

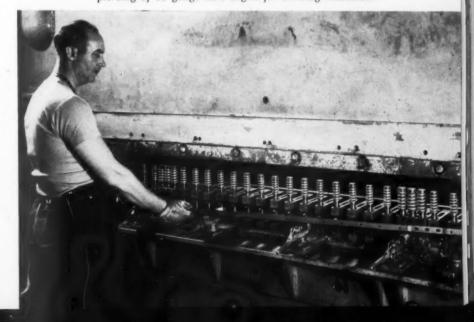
#### Mass production

#### and the 24-hour clock

Metals other than steel were developing along similar lines at approximately the same time. Paul Revere invented the process for rolling copper. One of the early fruits of mass production were 24-hour, springwound, brass clocks. These were produced for 20% of similar clocks made by hand tools. Small arms ammunition has been made of brass for many years. The hardware used on kerosene lamps to hold the glass chimney and wick were of brass.

Kitchen utensils were early cre-

Hole punching units mounted in a 1/4"-10 ft. power press brake for multiple piercing of 11 gauge steel angles for vending machines.

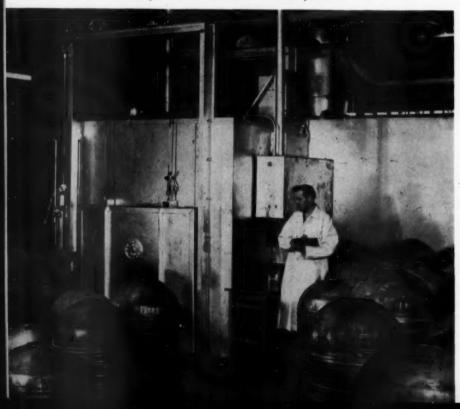




Double-action hydraulic press used to draw seamless silicon copper hemispheres for gas water heaters. Yield is one finished piece per stroke. First die re-strikes flange radius, center die draws, right die pierces holes and trims.

#### WATER HEATERS

Hemispheres are then transferred to an oven where they are heated for one hour at 780°F, to effect the stress relief. This operation is held within an 8° temperature variation in the 64 cu. ft. oven.



ations of the stamping industry. When presses with sufficient power and stroke became available, pails and tubs were stamped. The beginning of this century witnessed the drawing of a bathtub, but unlike those of today, the metal had to be heated for the process. The mass-produced auto made its appearance about 40 years ago. Most of the parts were formed and not deep drawn as those of today.

Auto tires in the beginning were small and the fenders were shallow. The advent of balloon tires led to deeper fenders and new principles of drawing metal. The early radiator shells required new developments in cam operated expanding dies for forming the hood ledge and piercing holes. Many panels had to be made in several pieces because of press sizes and width of steel sheets that were available.

Press manufacturers helped tremendously in the development of our great industrial achievements both here and abroad. In many cases, dies were made and shipped with new presses. I am reminded of instances over 32 years ago when dies and presses were shipped to Japan for making drawn hand car wheels. At the same time shipments were being made to Fiat in Italy, and Berliet in France for automobile parts.

### The effect of larger presses and wider sheets

As larger presses and wider sheet metal became available, the turret auto top became a reality, and finally box car ends and panels were made of high tensile steel. In fact, today steel sheets 90" wide come off the rolling mills at a mile a minute clip. Likewise, presses of tremendous proportions are in use in tonnages of many thousands of tons. If the metal holds out, the "ultimate home" may yet be made of steel.

The development of other industries in the onward march of metal-working has been no less spectacular. Modern appliances fill almost every home and includes laundry equipment, air conditioners, dishwashers, heaters, ranges, refrigerators and steel kitchens. To these may be added

FEBRUARY . 1954 finish

radio, television and metal furniture with business machines and vending machines thrown in for good measure. The last 100 years may truly be called "The Century of Metalworking Progress."

Each automobile represents the fabrication of about 3,000 pounds of steel and iron, while each freight car requires about 17 tons. Large ocean liners and high skyscrapers require about 50,000 tons of fabricated metal. Speaking of "tremendous trifles," bobby pins consume about 6,000 tons of metal each year, with coat hanger requirements 30,000 tons. The amount of steel used in making tractors and farm equipment reaches staggering tonnages of metal.

#### Tailor-made metals

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The metals used by each industry are so great that each can buy tailor-made metal best suited for their products. Steel may be hot rolled or cold rolled. It may be low or high carbon, or it may be an alloy. Steel may be procured that has high tensile strength. Either stainless steel or steel that may be vitreous enameled are available. Boiler plate and armorplate each has its role in the metal-working sphere. These are but a few of the types of steel out of the 5,000 alloys compounded from a score of natural metals in use today.

Of equal importance to this fabulous metalworking industry are the people that contribute to its success. This industry provides jobs for almost eight million people. This represents almost half of all of the workers in all of the manufacturing industries. Of this total, one and a quarter million workers are employed in the fabrication of metal. The stamping phase of metalworking embraces about 2,000 firms, comprising a billion-dollar industry.

Measured by any standard, the accomplishments of the stamping industry in less than 100 years have been phenomenal. Stampings have become an integral part of our daily life and have made substantial contributions to our high standard of living. Their remarkable past will only be exceeded by their assured future. We shall continue to "advance with stampings" "from raw metal to finished product."

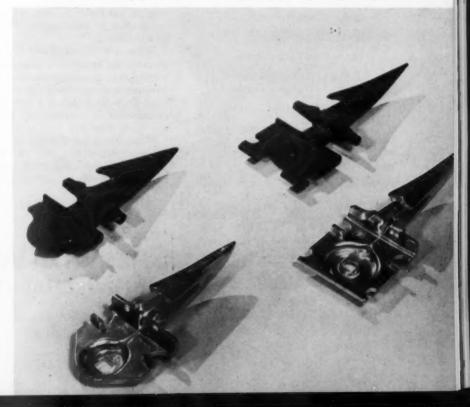
finish FEBRUARY . 1954



Drawing 1/4-in. steel cover, 4½-in. deep, in a 2500-ton single-action hydraulic press. The heavy gauge cover is for the hydraulic control mechanism in huge earth-moving machinery.

#### EQUIPMENT

Two styles of stamped mowing machine guards and their malleable casting counterparts. Although the stamped guards are made of 3/16-in. steel, one of them shows a sharp point that was entirely processed in punch press operations.





# New, WATER-reducible enamel cuts fire hazards...retains top film properties

- REDUCES FIRE HAZARDS during application and storage
- ELIMINATES EXPENSE for reducers . . . requires only water
- REDUCES PAINTING FUMES and ODOR
- PROVIDES CONVENTIONAL FILM PROPERTIES

One of industry's biggest problems—the fire hazards present during application of conventional finishing materials—now can be reduced or eliminated.

Sherwin-Williams Water-Reducible Enamel—a product of extensive research and experience in industrial emulsions—utilizes only water as a reducing agent. It will not burn, in liquid form, at normal room temperatures, nor during spray or dip application, even if exposed to open flame. It produces a very hard gloss finish with properties equal or superior to conventional organic solvent enamels. Cured film is not water soluble.

Water-Reducible Enamel is available in black for finish of machine or metal parts of all types—can also be supplied in colors. Contact your Sherwin-Williams Industrial Representative for details, or write The Sherwin-Williams Co., General Industrial Division, Cleveland 1, Ohio.



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### Hot spray lacquering of naval aircraft

by William A. Gottfried . AERONAUTICAL MATERIALS LAB., NAVAL EXPERIMENTAL STATION



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One of the most important advances in the field of lacquering, in the past few years, has been the FEATURE successful development of

a technique for applying cellulose nitrate lacquers at elevated temperatures. This technique, called the hot spray process, substitutes heat for reducing viscous lacquer to spraying consistency, rather than thinner, as is done in conventional spraying. It is now generally accepted that the benefits of hot spraying lacquer are savings in time, labor and materials. The resultant films also show less orange peel and dry spray. Another decided advantage is a lesser tendency towards blushing when application is under conditions of high humidity. This latter factor is due to the presence of a richer solvent blend, containing a larger proportion of high boiling "true solvent" ingredients. In the conventional cold spraying of lacquer, use of the same solvent blend generally results in sagging of the film.

The Navy Bureau of Aeronautics, being cost conscious and on the alert for superior materials or processes, initiated an investigation at the Naval Air Experimental Station to examine the advantages reported by industry of the hot spray technique for application of suitable cellulose nitrate lacquers to the exterior aluminum skins of military aircraft and to compare the physical properties of films applied by the hot spray process with conventional cold spray lacquer films.

The following conclusions were drawn, based on laboratory tests at the Naval Air Experimental Station:

(a) Specification MIL-L-7178 nitrocellulose lacquer lends itself well to hot spray use, without modification, after an approximate 33% reduction with Specification MIL-T-6095 lacquer thinner. The normal reduction of this lacquer for conventional cold spray purposes is approximately 150 to 200 per cent with Specification MIL-T-6094 lacquer thinner. Thus, a considerable monetary saving is reflected in thinners.

(b) The required lacquer dry film thickness (approximately 1 to 11/2 mils) could be achieved with one hot, double pass or cross coat, whereas at least two cold cross coats are necessary to attain the same dry film thickness. Thus, it was estimated that at least one quart of lacquer thinner would be saved for each quart of lacquer used. Lacquer would also be saved since there is less dry spray.

(c) Hot lacquer would increase finishing room capacity with its one coat application by effecting a more rapid turnover of aircraft in the lacquering process.

(d) The hot lacquer process, since only one coat is applied, would eliminate the necessity for sanding between multiple coats of lacquer as is usually done with cold spray. On aircraft, the hazard exists with multiple cold spray coats that sanding between coats may cut through the first coat of lacquer on rivets and skin laps. This is particularly dangerous if magnesium is used on the airplane since this metal, when in contact with a dissimilar metal in a salt laden atmosphere, which exists in carrier operations, corrodes rap-

(e) The resultant film properties of lacquers applied by hot and cold spray are equivalent with respect to weathering in subtropical areas, such as Florida, for a one year period.

The Navy Bureau of Aeronautics, upon analyzing the above data, decided to conduct application tests of

Schematic drawing of a heating unit for hot spray lacquering.

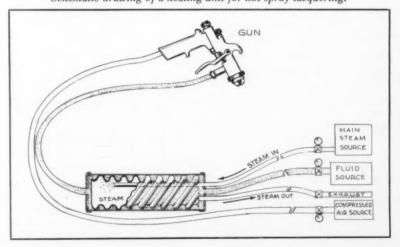


TABLE I
Wash Primer, Specification MIL-C-15328

	Pounds per 100 gallons of mixed material	Gallons per 100 gallons of mixed material
Ingredients of resin component (80 gallons)		
Polyvinyl-butyral resin¹ Zinc Chromate (insoluble	56	6.10
type) <sup>2</sup>	54	1.59
(Type A or B, of Spec.		
MIL-M-15173)	8	0.35
Lampblack (Spec. TT-L-70) Butyl alcohol, normal	0.6	0.04
(Spec. TT-B-846)	125	18.40
Ethyl alcohol (grade III of Spec. O-A-396) <sup>3</sup>	380	55.70
Phosphoric acid (Class A		
of Spec. O-P-313)	28	2.0
Water (maximum) Ethyl Alcohol (grade III of	25	3.0
Spec. O-A-396)3	102	15.0

<sup>1</sup>The resin shall be a polyvinyl partial butyral resin containing only polyvinyl butyral, polyvinyl alcohol, and polyvinl acetate in the molecule. The resin shall be one of two types conforming to the following requirements:

	Type I	Type II
Polyvinyl alcohol, percent by weight	18.0 to 20.0	10.5 to 13.0
Polyvinyl acetate, percent by weight, maximum	1.0	1.5
Viscosity:		
6 per cent in methanol,	10 . 10	
centipoises at 20°C 5 percent in ethanol (95	13 to 18	
percent), centipoises at		,
25°C		18 to 28
Specific gravity	1.05 to 1.15	1.05 to 1.15

<sup>2</sup>The zinc chromate shall be of an insoluble type, showing an analysis 16 to 19 percent CrO<sub>3</sub>, and 67 to 72 percent ZnO, and not more than 1 percent water soluble salts.

<sup>3</sup>Isopropyl alcohol (99 percent) may be substituted for ethyl alcohol on an equal volume basis. The isopropyl alcohol shall have a specific gravity of 0.785 to 0.790 and a distillation range not greater than 1.5°C. and this range shall include 82.3°C.

TABLE II

#### Synthetic Zinc Chromate Primer, Specification MIL-P-6889

Ingredients	P	er	. (	C	ent by
Ingredients Cinc Chromate (Specification TT-Z-415)					28.0
Magnesium Silicate (Specification TT-M-90)					
Alkyd Resin - 60% in Xylene (Note (1))					
Dispersion Resin - 50% Solids (Note (2))					10.0
Aluminum Stearate Gel (10% in Xylene)					4.0
Malic Acid					.1
(ylene					16.4
ead Naphthenate Drier (24% metal)					
Cobalt Naphthenate Drier (6% metal)					
			_		100.0
Note (1) — Aroplaz 1365 made by U.S. Industrial Chemical (2) — Bakelite Corporation's 3962 Resin	3				

#### Lacquer Type Primer, Specification MIL-P-7962(AER)

		nt by We
Zinc Chromate (Specification TT-Z-415)		11.3
Aluminum Silicate (Note (1))		11.3
Alkyd Resin - 60% in Xylene (Note (2))		
Toluene		
1/2 second Nitrocellulose Solution (Note (3))		38.0
		100.0
Note (1) — Such as ASP-100 made by Edgar Bros. 100 (2) — Aroplaz 1365 made by U.S. Industrial Chemic (3) — Composition by percent by weight ½ second cellulose nitrate (70% in Ethano Methyl Isobutyl Ketone Ethyl Acetate Isopropyl Alcohol Butyl Alcohol Xylene	d)	28.2 14.6 8.2 .14.6
		100.0

#### TABLE IV

#### Glossy Sea Blue Lacquer, Specification MIL-L-7178

Ingredients	Per	Cent by
itanium Dioxide, R610		1.0
elori Blue		9
ed Iron Oxide		2.8
arbon Black Dispersion (Note (1))		2.6
ricresyl Phosphate		
lkyd Resin - 60% in Xylene (Note (2))		27.2
second Cellulose Nitrate (Note (3))		
utyl Acetate		
oluene		
utyl Alcohol		
ethyl Ethyl Ketone		
ethyl Ethyl Retolic		0.4
		100.0
Note (1) — R.B.H. #6077		100.0
(2) — Rohm & Haas Resin Duraplex ND-78		
(2) — Rollin & Haas Resin Duraplex ND-18		

#### TABLE V

#### Lacquer Thinners, Specification MIL-T-6095 (for use in hot spray)

Ingredient	Per	Ce	nt by
Butyl Acetate			40.0
Normal Butyl Alcohol			
Aromatic Petroleum Naphtha			25.0
(Specification AN-VV-N-96, Type II)			
Amyl Acetate			10.0
			100.0

the hot spray lacquer process at a Navy Overhaul and Repair base on several aircraft which were undergoing repair there.

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Initially, production difficulties were encountered. These, after an investigation, were attributed to insufficient controls necessary to provide paint films of a uniform thickness and the necessity of training painters in the use of hot spray equipment and in the different techniques required in handling of the spray gun. After resolving the difficulties, 24 aircraft were painted with the hot spray lacquer technique. Personnel at the Overhaul and Repair base were extremely pleased with the application results. A review of the procedures used in refinishing the aircraft after they were stripped of their old finish follows:

#### STEP 1 - SURFACE PREPARATION

Two methods are usually used for cleaning dirty and oily aluminum surfaces prior to painting. If a steam jenny is available, the first method is preferred, but the second is also satisfactory.

Method 1 — Four ounces of Specification MIL-C-6135 powder, which consists of a mixture of silicates, phosphates, carbonates and a synthetic detergent are dissolved per gallon of water and is shot out from a steam jenny at the aluminum surfaces.

Method 2—One part by volume of the concentrate of Specification MIL-C-7122, Solvent Emulsion Grease Remover, is added to nine volumes of kerosene. The resultant mixture is sprayed or mopped onto the aluminum surface. Several minutes later, it is rinsed off with water. When using either of the above methods, the aluminum is permitted to dry.

#### STEP II - METAL CONDITIONING

Specification MIL-C-15328 Pretreatment Coating, commonly known as wash primer, functions as the metal conditioner by providing an excellent base for paint adhesion. Its formulation is given in Table I. The quantity of wash primer mixed is limited to the amount which can be consumed within eight hours, TABLE VI

Lacquer Thinner, Specifications TT-T-266 and MIL-T-6094
(for use with lacquer for cold spray or with lacquer type primer)

		by Weight MIL-T-6094
Normal Butyl Acetate		25.0
Methyl Isobutyl Ketone	31.0	***
Ethyl Acetate		22.0
N-Butyl Alcohol		10.0
Methyl Isobutyl Carbinol	8.0	
Isopropyl Alcohol	11.0	
Toluene	25.0	22.0
Low Flash Aliphatic Petroleum Naphtha		21.0
1	0.00	100.0

since a change occurs in this time to reduce its adhesion to metal surfaces even though no change may be apparent to the unaided eye. One part by volume of the acid component is added slowly in small portions with constant stirring to four parts by volume of the base solution which should have been previously stirred quite thoroughly to re-incorporate any settled out portion. The acid component is shaken prior to use and is always added to the base

Note: The opinions expressed in this article are those of the author and not necessarily official opinions of the Naval Air Experimental Station or the Navy Department.

solution, never vice versa. For spray application, it is necessary to add a quantity of either ethyl (95% grade) or isopropyl alcohols (99% grade) equal to the volume of acid component used in order to obtain a uniform, thin, wet film of wash primer. The addition of the alcohol minimizes the tendency to "string" or "cobweb" on spraying and also permits the deposition of sprayed films of the required dry film thickness of 0.2 to 0.3 mils. Butyl alcohol may partially or wholly replace the other two alcohols under conditions of high humidity or when extreme hot weather prevails.

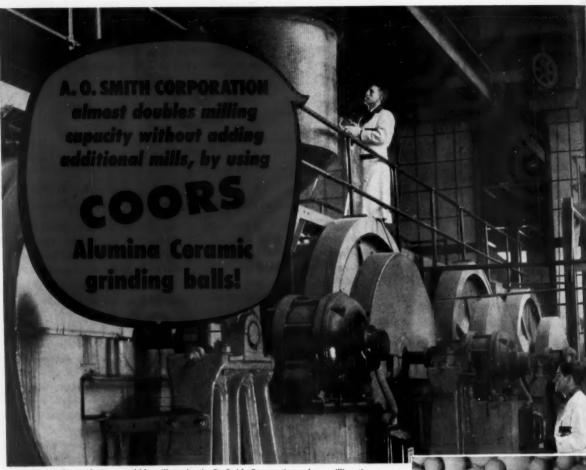
Before spraying wash primer, the lines are first cleaned with alcohol. The operator does not attempt to obtain a full hiding spray coat as this only results in an excessively thick coating which only represents a waste of material and adds unnecessary weight. Fresh wash primer coats

may be immediately removed with alcohol if application errors are made. However, if left on for several hours, paint removers are needed.

Wash primer films dry within a few minutes for safe handling. Approximately thirty to forty-five minutes after application, the wash primer film is scuffed lightly with either #320 or #400 wet or dry sandpaper. If preferred, dry scuffing with Kraft wrapping paper to remove overspray and smooth out any nibs is every bit as good as using sandpaper. The final step is to remove any dusting with tack rags. Before proceeding to the next step, the lines are cleaned with alcohol and blown dry.

#### STEP III - PRIMING

Either of two zinc chromate type primers are then used. One is a synthetic, Specification MIL-P-6889; the other, a lacquer type, Specification MIL-P-7962(Aer). The formulas for both specifications are listed in Tables II and III, respectively. One volume of the synthetic primer is reduced for spraying with two volumes of toluene, whereas one volume of the lacquer type primer is reduced for spraying with one and one-half volumes of lacquer thinner. Either Federal Specification TT-T-266 or MIL-T-6094 will suffice. From thirty to forty-five minutes after application of either primer, which again is applied in thin films (dry film thickness of 0.3 to 0.4 mil), the films are either scuff sanded with sandpaper or Kraft paper as described under wash primer. The author personally prefers the lacquer type primer since it dries more quickly to Page 82 ->



Workmen charge a pebble mill at the A. O. Smith Corporation—where milling time was reduced 46%—from 5,800 revolutions to 3,100 by using Coars Alumina Ceramic Grinding Balls.

The use of Coors High Density Grinding Balls, according to actual experience in enameling plants, will produce these results:

1. Permit you to obtain greater output per mill.

2. Reduce cost of balls because of much lower ball loss due to wear.

Increase the life of your porcelain mill linings when mills are properly charged.

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"We find that to produce the proper fineness, 3,100 revolutions per batch are required with your Alumina Balls [in a 5'x6' mill]. With the previously used balls, 5,800 revolutions were required for the same fineness, or nearly twice the time requirement.

"This improvement in grinding cycle time means that we can almost double our productive capacity without adding additional mills. Besides the cost and difficulty of obtaining new mills, the floor space saving effected for increasing the capacity is often important...

"...31 batches of glass-lined slip have been ground in this mill with no additional [Coors Alumina] balls being added for wear. Our previous records reveal that with conventional balls, we were having to add 12 pounds of balls per charge for ball loss during each cycle of grinding."

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Available from stock in sizes 1", 1¼", 1½", 1¾", 2" and 2½" and in the new Natural Shape Media.

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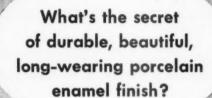
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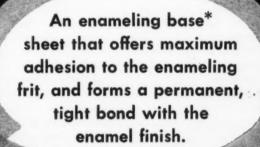


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### The outlook for electrical appliances

summary of prospects for both appliances and equipment in the electrical field

by W. J. Donald . MANAGING DIRECTOR, AND A. J. Nesti . CHIEF STATISTICIAN, NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION, NEW YORK CITY

THE electrical manufacturing industry, after establishing a new all-time high in business activity during 1953, is getting ready to meet a demand for electrical products in 1954 that will be almost as great as that for the year just ended. For the new year, the industry expects only a slight decrease — from 3 to 5% — in the record \$15½ billion worth of shipments made in 1952. The 1953 volume was about 7% higher than the volume of shipments for 1952.

All branches of the industry showed increased activity with the exception of building equipment and supplies. The latter suffered a decrease in sales in 1953 of about 5% from 1952; while shipments of insulating materials increased about 15%; appliances, about 10%; industrial apparatus, wire and cable, and illuminating equipment, about 5%; and generation, transmission, and distribution equipment, and signalling and communication equipment, about 3%.

#### Reasons for the all-time

high in 1953

Many factors contributed to the very successful year just experienced by the industry. Overall industrial production in 1953 was almost 10% higher than in 1952 (new FRB Index of 135 for 1953 versus 124 for 1952). Building construction set a new record with total construction in 1953 being about 7% higher than in 1952. Personal income (\$285 billion) and consumer expenditures (\$230 billion) were also at record levels. Appreciable additions were made to generating capacity with almost 10 million kilowatts of new capacity added during the year. Sales of electrical energy set a new record of over 380 billion kilowatt hours sold. Electrification of farms and of industry continued at increasing rates.

Each of these factors had a marked influence on a particular branch of this multi-product industry. For example, consumer earnings and expenditures brought about the new levels in sales of all kinds of electrical appliances which altogether were 10% higher in 1953 than they were in 1952. This increase in appliance business, together with the increase of 5% in sales of industrial apparatus and of 5% in sales of illuminating equipment, indicates a definite trend toward the closing of the gap between the availability of, and the utilization of, electrical energy.

In the case of generation and transmission equipment - including such products as power and distribution transformers, turbines, switchgear, and electrical measuring instruments - the industry expects that the peak volume of business obtained in 1953 will be repeated in 1954. This estimate is based principally upon the fact that there are definite plans to expand generating capacity further with an estimated addition of another 11 million kilowatts in 1954, and on the fact that there will also be a further increase in output of electrical energy amounting to an additional 27 billion kilowatt hours.

#### 1953 — a big appliance year

Nearly all lines of electrical appliances experienced sales increases in 1953 over their 1952 levels. The outstanding performance was made by room air conditioners, which have been selling in steadily growing numbers since 1946, and whose sales volume in 1953 almost tripled that of

1952. Substantial gains were also made by a number of major appliances which have been on the market for a much longer period of time. For instance, dollar sales of fans in 1953 rose 40% over 1952, ranges, 25%, water heaters, 10% and refrigerators, 5%. Housewares, representing both "old" and "new" products, had an overall sales increase of 40%.

Sales trends among the group of appliances developed in the postwar period, and for which a large potential market exists, showed some selectivity on the part of buyers. Food waste disposers, dehumidifiers, and electric clothes dryers all sold in greater volume than in 1952. Sales of farm and home freezers, on the other hand, remained close to their previous year's levels while dishwashers and ironing machines showed a sales decline.

#### Increased demand for larger capacity appliances

A combination of circumstances contributed to the overall increase in appliance sales in the year just ended. Personal income, new home construction, and the number of wired homes all reached record levels in 1953. Coupled with these factors were consumers' replacement needs, which the manufacturers met by new and improved models and by increased sales efforts. Also, as in past years, buyer preference for larger models continued to stimulate sales of some of the major appliances. For example, refrigerators with a capacity of 9 cubic feet or over, accounted for 65% of the total sold in 1953, compared to 54% in 1952, 30% in 1949, and 7% in 1946. A similar trend existed for

to Page 66 ->

### The outlook in the gas appliance field

the gas appliance and equipment industry and its opportunities

by Edward R. Martin . DIRECTOR OF MARKETING AND STATISTICS, GAS APPLIANCE MANUFACTURERS ASSOCIATION, NEW YORK CITY

N ANALYZING current economics and in forecasting probable near future conditions in the light of individual industries and companies, we must above all be practical. Some industries will, and have indicated that in 1954 their business will decline upwards of 10%. Therefore, to consider the common average onto which economists apparently have latched, (5% decline), other components of industry must maintain, or even increase, their relative performance in comparison with the national average. In viewing 1954, we must also keep in mind the fact that inventory adjustments were effected during 1953 at the manufacturer, wholesaler and dealer levels.

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Out of all the confusion comes one outstanding fact — that is the long heralded arrival of a highly competitive "Buyers Market". This does not necessarily lessen the market, but in terms of 1954, means greater effort in the locating and exploitation of both existing and new markets. It also means we are going into a period of rugged, knock-down-drag'em-out, competition, and any success will be measured only by ability to sell.

Industry in general has indicated an increase of advertising expenditures by about 10% during the next twelve months. In addition to more aggressive advertising and sales promotion, it appears that consumer goods manufacturers and industries will endeavor to further stimulate markets for their products by product improvement and practical and pointed salesmanship.

### Gas appliance and equipment manufacturers' position

We have before us an opportunity to reverse the generally anticipated, downward economic trends. Then, we might even perform during the coming year at a level far *above* the national average.

There are several reasons — here are just a few:

First . . . Annual gas appliance sales up to this time have not kept pace with the growth of the gas utility and LP-Gas industry, 1,000,000 new customers each year.

Second . . . 1953 is behind us and was the year in which manufacturers and gas utilities recognized the elements missing from existing merchandising policies, and decided to do something about it—it was designated as the year for self appraisal and for picking up the loose ends in preparation for future sales.

Third... The Action Program for Gas Industry Development which was conceived as a vehicle to create greater sales through better merchandising, is in operation and ahead of schedule.

Fourth . . . GAMA's continuing Public Relations Program is hitting its full stride and is creating greater impact on the consuming public.

Fifth . . . Closer cooperation between gas utilities and gas appliance manufacturers in conditioning and selling the markets is fast becoming a reality.

#### Other factors

Those are only a few of the factors affecting the outlook for gas appliance and equipment manufacturers. Other factors which must be considered, and which are a basis for optimism, are continued technical research, performance and design improvement, marketing research, and improvements in dealer, builder and developer relations.

Naturally, the attainments of any industry are dependent upon the performance of its individual components. In other words, the sum total of the sales of each company combines to form total industry sales. Throughout this General Business Outlook survey one important fact stands out; that is, the great majority of reporting manufacturers expect industry sales to drop moderately, but expect their own sales to increase. Nevertheless, the expected sales performances of these individual companies in most instances, is well within the realm of achievement.

#### The "consensus" could be reversed

In the light of expected economic conditions during 1954, to increase sales over 1953 volumes, any company must put the emphasis on enthusiastic merchandising and competitive selling. It is doubtful that any company would forecast any increases in its 1954 sales without first planning its approach to existing and new markets, and without adding potency to its sales force.

With these thoughts in mind, and with each gas appliance and equipment manufacturer putting forth the efforts which will transmit his intentions into reality — this "consensus", which indicates a decline during the coming year, could be reversed.

That markets for gas appliances and equipment do exist, and will continue to expand, is as certain as the sun's rising and setting. For example, we enter 1954 with over 32,000,000 gas-served homes (LP and City), an increase of more than a million residential customers over last year, the basis of a tremendous replacement market.

10 Page 66

if you want alkali resistance



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Ingersall manufactured tubs about to be immersed in pickling tank.





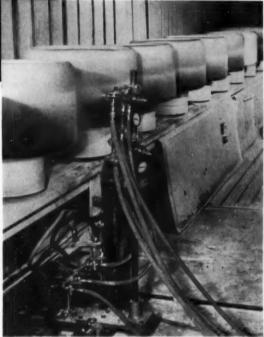
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From start to finish, Ingersoll "know-how" can provide the answers to any tub problems you may have. See for yourself-consult Ingersoll on your next tub design.

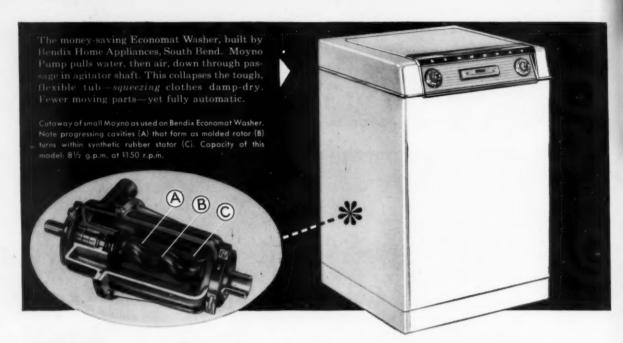


Automatic sprayers assure uniform finish, lower costs.



INGERSOLL PRODUCTS DIVISION

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# Pump life increased 650% in Bendix Economat Washer with the versatile MOYNO Pump!

### THE MOYNO

the world's simplest pump!

Versatile—Pumps liquid, pastes, abrasive-laden slurries. Adaptable to heavy industrial machinery or small drink dispensers, oil burners, sprayers, etc.

Positive Displacement— Moynos are available to pull up to 29" of vacuum while discharging under pressure. Big Moynos can deliver up to 250 gallons per minute. Pressures up to 600 psi can be obtained. Pumps in either direction!

Gentle—No churning, foaming; won't break up semi-solids. One Moyno is actually pumping potato salad!

Trouble-Free — Self priming; won't cavitate or vapor-lock. Just one moving part—no valves to stick, no pistons to gum up. Low starting and running torque.

An unusual application of interest to builders of products using pumps.

Bendix Home Appliances' answer for a lower-priced fully automatic washer was fewer moving parts... a flexible tub to contract and squeeze clothes dry. Problem: finding an air-water vacuum pump that would do the job.

Bendix tested several different pumps, but none met specifications. The best averaged only 200 cycles before lint, golf tees, buttons and similar foreign particles caused damage and clogging.

But two years ago a completely different pump was first used in production—the R & M Moyno Pump. Specifications required 27" minimum vacuum for a new pump... Moynos pulled 28". Specifications allowed a drop to 26" after 1500 cycles... Moynos had virtually no drop. In short, Moynos clearly out-performed the other pumps tested, and lasted seven and a half times longer! Several Moynos still performed

well after 3000 cycles...equivalent to 10 years of normal washer operation. Service? With Moyno Pumps as

Service? With Moyno Pumps as standard equipment, pump service calls are practically non-existent. Foreign particles don't cause trouble. Lint passes through the Moyno easily, without clogging.

#### Moynos may help improve YOUR product!

If you use pumps, find out about the Moyno—the world's simplest pump! Your application needn't involve vacuum; possibly you need non-pulsating pressure. Nor must you take a "standard" Moyno. If necessary, the progressing-cavity principle can be adapted to your requirements, as it was so successfully to the Bendix Economat Washer.

#### Get more facts!

Returning the coupon below will bring you an interesting, factual bulletin on the Moyno Pump—and how it works. It costs nothing to find out if this problemsolving pump can help you...mail the coupon today!

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Company
Address



A representative group of AHLMA members—left to right: E. C. Koellner, Geuder, Paeschke & Frey; Jack Sellass, Dexter; C. M. Yelton, Packard Electric; Bill Hunt, Dexter; J. E. Scanland, New Monarch; Augie Paeschke, GP&F; Jack Murray and A. C. Fallon, Speed Queen; E. A. Labisky, Barton.

# Manufacturers optimistic at annual home laundry meeting

retiring president predicts production of "close to" 5,000,000 units for 1954

PTIMISM over the outlook for 1954 characterized the American Home Laundry Manufacturers' Association annual meeting, January 8, at Hotel Morrison, in Chicago.

W. Homer Reeve, head of the Easy Washing Machine Corp., Syracuse, N. Y., elected to the presidency of the association, asserted that prospects for satisfactory sales volume during the year are good, provided that manufacturers operate with certain sound objectives.

W. R. Dabney, retiring AHLMA president and head of Ironrite, Inc., Mt. Clemens, Mich., earlier had stated that combined sales of washers,

#### 1954 AHLMA Officers

President: W. Homer Reeve, president, Easy Washing Machine Corp., Syracuse, New York.

1st Vice Pres.: Elisha Gray II, president, Whirlpool Corporation, St. Joseph, Michigan.

2nd Vice Pres.: Frank Breckenridge, President, Automatic Washer Co., Newton, Iowa.

3rd Vice Pres.: J. H. Goss, general manager, home laundry equipment department, General Electric Co., Louisville, Kentucky.

Treasurer: Howell G. Evans, senior vice president, Hamilton Manufacturing Co., Two Rivers, Wisconsin.

dryers and ironers in 1954 possibly would come close to 5,000,000 units, compared to an estimated total of 4,500,000 in 1953.

Reeve said that the industry "can, and probably will, adjust its merchandising and manufacturing programs to supply high quality products with improved features at reasonable retail price levels, and with adequate dealer and distributor profit." He spoke of need for added effort in the industry's engineering, manufacturing and distribution branches, "to supply the highest values which will attract the consumer," and urged careful study of distribution and thorough training of distributor-dealer organizations in selling, servicing and financing.

### Third Easy president to head association

Reeve is the third Easy president to head AHLMA. The late H. P. Nelligan, whom he succeeded as president of the Syracuse concern, headed the association in 1949-50 and J. C. Nelson, who died in January, 1952, held the industry post more than a decade ago. The association presidency has not been held more than once in any other firm.

The association's members honored Dabney by giving him a silver tray commemorating his term as president.

Committee chairmen reporting at the annual business session contributed to the optimism voiced by Presidents Reeve and Dabney. Frank Breckenridge, president of the Automatic Washer Company, Newton, Iowa, and chairman of the association's conventional washer division, asserted that the product "will undoubtedly remain an important factor in our industry for many years to come." He reported that editors are being urged to observe proper distinctions when referring to washers, for the purpose of obtaining correct

W. HOMER REEVE





# We've specialized in stampings for the washing machine industry

THE problem of supplying washing machine tubs has been turned over to us by leading manufacturers time and time again.

We're glad to have the reputation of leadership in the field. And we accept the responsibility. You will find Mullins ready always with the best technical knowledge and equipment. You will find an alert, progressive attitude—an honest belief that the problems of your business are our problems too.

In planning for the future or for the most economical source for current production, consult with us. Mullins has made many notable contributions to the industry's progress and hopes to make many more.



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• DIECASTINGS







Edith Ramsay, of American Home magazine, is shown between Gene Crandall, of Lux Clock, and A. L. Reiter, of Norge. On right is Hank Gibson, of Lux Clock.

recognition of the conventional type.

Home laundry appliances rapidly are becoming first-floor equipment and manufacturers thus should work more closely with architects, home builders and modernization firms in developing well-planned laundering areas, allowing sufficient space for easy accommodations and for proper plumbing, venting and installation, said the report of Elisha Gray II, president of the Whirlpool Corporation, St. Joseph, Mich., and chairman of the automatic washer division, presented in his absence by V. F. Peterson, sales manager, home laundry equipment, Norge Division, Borg-Warner Corporation, Chicago.

#### Prediction for '54 is 1.6 automatic to 1 conventional

Gray's report predicted further developments in the introduction of combination washer-dryers and a ratio of 1.6 automatics to 1 conventional washer in 1954 production, a gain in the relative position of automatics but with a slight overall out-

put "slightly under 1953." The designing of automatic washers and dryers has advanced considerably ahead of plumbing and electrical improvements, Gray declared. He urged the manufacturers to give time and attention to proposals for new or revised installation codes which, he predicted, will bring added complexities. He joined Breckenridge in urging proper nomenclature for home laundry equipment. "The term automatic is being used so loosely that unless we establish a set of rules the term soon shall become meaningless,' he said.

Sale of automatic tumbler dryers exceeding 800,000 units in 1954, contrasted with an estimated total of 700,000 in 1953 and 92,000 dryers in 1948 was predicted by Robert M. Mitchell, vice president of the Whirlpool Corporation in his report as chairman of AHLMA's dryer division, presented by John M. Wicht, vice president, Blackstone Corporation, Jamestown, N. Y. The industry "came of age in 1953, after five years"

#### **AHLMA** Executive Committee

Automatic Washer Division: V. F. Peterson, laundry sales mgr.; Norge Div., Borg-Warner Corp.; J. J. Anderson, laundry div. mgr., Westinghouse Electric Corp.

Conventional Washer Division: Frank Breckenridge, pres., Automatic Washer Co.; H. C. Buckingham, pres., Thor Corporation.

Dryer Division: R. G. Halvorsen, vice pres.-sales, Hamilton Mfg. Co.; L. I. Sweetland, laundry sales mgr., Hotpoint Co.

Ironer Division: H. L. Biddle, vice pres.-sales, Ironrite, Inc.; Homer Travis, mgr. retail distribution, ironer division, Nash-Kelvinator Corp.

spectacular growth," he said.

#### Over 40 dryer brand names

Mitchell's report pointed out that the number of dryer brand names exceeds forty which, he asserted, tops those of either washers or ironers. New and lower-priced models and many national sales drives marked inauguration of more aggressive merchandising practices in 1953, he said. Recognition by architects and builders and by "the many public utilities, both electric and gas, who



John McCord, Ferro; L. A. Shelton, New Monarch; Harold Leisey, Beam Mfg.; and A. C. Anderson, New Monarch.

Right: The long and short of AHLMA — Glenn Franks, of Altorfer Bros., and William Shaw, who handles publicity for home laundry industry.

Left: Kendall Clark, of Hotpoint, puts his point over with D. A. Badenoch and L. R. Miller, of Ingersoll.

finishfotos



C. S. O'Neill, Hamilton; A. H. Gerhardt, Norge Morton, Westinghouse; and P. H. Korrell,



have spent hundreds of thousands of dollars on the promotion of dryers this past year" prove the importance and acceptance of the dryer, Mitchell's report added.

Mitchell revealed that although dryer saturation is "only about 5 percent," the product is being sold for use in low-to-medium priced houses, "not exclusively to the carriage trade as so often happens in marketing a new and relatively high-priced appliance." He gave the purchase breakdown as follows: 35.8 per cent, \$4,000-\$10,000 homes; 46.5 per cent, \$10,000-\$25,000, and 17.7 per cent, over \$25,000.

"Ironer manufacturers are definitely encouraged by the fact that the saturation point of the appliance has reached 9.9 percent, very little below that much talked of 10 percent at which household appliances traditionally start expanding rapidly into much greater adoption," said the report by L. O. Reese, president and general manager of the Armstrong Products Corporation, Huntington, W. Va., as chairman of the association's ironer division. It was submitted by Hal L. Biddle, vice president in charge of sales, Ironrite, Inc., Mt. Clemens, Mich.

#### Specialty selling is

#### needed for ironers

"Another optimistic note is the realization by manufacturers, distributors and dealers that specialty selling is particularly needed for ironers. Demonstration, exposure, advertising and promotion will do the job. No half-hearted attempts will."

Reese urged the ironer manufacturers "to put special emphasis on promoting with distributors and dealers the excellent ideas presented in 'Plan For All Three,' prepared by the association's very able sales and advertising committee. Several leading merchandisers already have formulated their plans in that direction. Sales, and plenty of them, can be realized on ironers if a live-wire sales and promotional program is undertaken by every manufacturer."

#### "Plan for All Three"

Norge

Almost 100,000 copies of "Plan for All Three", a 20-page book dis-

finish FEBRUARY . 1954



Fred Shock and Chas. Richardson, of Sperry Rubber & Plastics; A. C. Holmdahl, One-Minute Washer; Ken Ewing, AllianceWare; and Jack Barnett, Sperry.

cussing the household laundry, has been distributed to educators and newspapers and magazine editors, reported Hal Biddle, chairman of AHLMA sales and advertising committee.

Dabney told the meeting of progress in fighting for removal of the excise tax from dryers and ironers and against imposing of any such tax on washers.

#### Associate membership represented

Speaking for the AHLMA Associate membership, sixty suppliers to the appliance manufacturers, the report of T. C. Craig, chairman of the Associate's committee and district sales

manager of Mullins Manufacturing Corp., traced his connection with the industry from 1926, when production of washers totalled 400,000 units. Purchasing agents had a list of thirteen concerns supplying virtually all the manufacturing needs of the washer producers.

#### Rheem admitted as member

Rheem Manufacturing Company was admitted to Associate membership and it was announced that Altorfer Brothers Company, Peoria, Ill., purchased last year by the Kelvinator Division of the Nash-Kelvinator Corporation, Detroit, became a Regular member of the association.



D. A. Badenoch and R. A. Anderson, Ingersoll; R. L. Sampson, Beam; H. E. Shepard and George I. Lind, Jr., of Appliance Engineering; J. W. Mitchell, Rupert Diecasting.

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Contingent from General Electric included S. M. Vance, M. W. Edgar, D. O. Brooks, H. E. Priwer, L. L. Ray, J. M. McNulty, and W. T. Burdick.



# Do you want to sell COMPONENTS to the metal products field?



FOCUS your selling firepower. finish blankets the multi-million dollar appliance and fabricated metal products field. Single plants use as much as 60 carloads or 100 trailer loads of components and materials a day. A good market for your product? You bet it is.

If you sell: motors — wire shelving — electrical controls — drive belts — wiring — gas cocks — valves — electric heating units — molded plastic parts — glass — castings — appliance trim or hardware — nameplates — rubber products — fabricated parts — insulation — fasteners or some other component to the appliance and metal products manufacturing field, then your sales story should be presented to this excellent market through finish. More and more leading suppliers are depending upon finish to do this important job for them.

The day of umbrella selling is over. Now is the time to focus your advertising and selling on the KEY MEN in the INDUSTRIES which buy and use your product in large volume.

These suppliers of components are reaching the appliance and metal products manufacturing field through finish.

Acme Aluminum Foundry Co.

American Nameplate & Mfg.

Co.

American Nickeloid Company

Appliance Engineering Co. Chicago Car Seal Company Chicago Dial Company City Auto Stamping Co. V. W. Danielson Mfg. Co. Detroit Brass & Malleable

Co.

Du-Wel Metal Products, Inc.
Ferrod Manufacturing Co.
Ferro Electric Products, Inc.
Firestone Industrial Products

L. H. Frost & Co., Inc.
General American Transportation Corp.

Geuder, Paeschke & Frey Co. Ingersoll Products Division Jervis Corporation The Lancaster Lens Co. The Lux Clock Mfg. Co. Marsco Manufacturing Co. The Meyercord Company
Mills Products, Inc.
Modern Plastics Corp.
Motoresearch Company
Mullins Manufacturing Corp.
The Nagel-Chase Mfg. Co.
New Monarch Machine &
Stamping Co.

New Products Corp.

Owens-Corning Fiberglas

Corp.

Pyramid Mouldings, Inc.
Reynolds Metals Co.
Robertshaw-Fulton Controls
Co.

Rupert Diecasting Co. Soreng Products Corp. E. E. Souther Iron Co. The Sperry Rubber & Plastics Co.

Tinnerman Products, Inc. H. W. Tuttle & Co. Tuttle & Kift, Inc. Union Steel Products Co. Universal Screw Co.

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Appliance and Metal Products Manufacturing

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## New designs highlight winter market

industry spokesmen predict that sales of room air conditioners will continue to climb, and that production of "white goods" will equal last year's output

THE winter homefurnishings market, held the first two weeks of January, in Chicago, brought out evidence that appliance manufacturers are acutely aware of the necessity of finding that "magical formula" to get their share of the consumer's dollar during 1954. More dressed-up appliances and more new innovations were in evidence than at any market in recent years.

#### Air conditioning in spotlight

At the annual appliance press conference at The Merchandise Mart, John M. Bickel, vice president of Carrier, asserted that sales of room air conditioners in 1954 should reach 1,200,000 units, a 30% gain over 1953. At the retail level, this means sales totalling about \$432,000,000, said Bickel. (At the same time, J. W. Alsdorf, president of Cory, predicted that room air conditioner sales would total 1,500,000 this year.)

## "White goods" production should equal '53 total — Norge president

George P. F. Smith, president of Norge, predicted that this year's "white goods" production will be as high as 1953, resulting in a sales battle with "more special promotion, price cutting and everything else to boost sales."

He said that the appliance industry has the toughest kind of competition with aggressive lightweight companies, which can "turn on a dime", and the heavyweights, some of which are the "giants of industry."

#### Color television sets in offing?

Joseph B. Elliott, vice president of RCA Victor consumer products, estimated that this year's color set production will hit 100,000 units. He said that RCA has equipment on order for 40 color stations. Elliott

also estimated that more than 5,000,000 black-and white sets will be sold this year, compared with about 6,500,000 in 1953.

#### New design in refrigerators

It was in the highly competitive refrigerator market that the most innovations were seen — evidence that manufacturers have had their design and engineering staffs busy creating new models to stimulate sales. Two companies — Deepfreeze and Crosley — brought out refrigerators which provide cold beverages through a tap in the door. The new line of Crosley Shelvadors were said to have been under development five years at a cost of more than \$4,000,000.

The Deepfreeze "Aqua-Tap" refrigerator had been introduced to members of the press and to company distributors early in December when the company presented its appliance

Monarch's new ranges, with "stoopless surface oven", are available in red, chartreuse, sunshine yellow, as well as traditional white.



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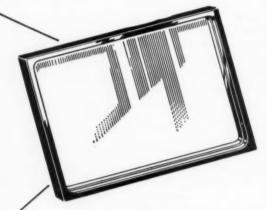
# Design Award Winner

# oven door windows



The National Industrial Design Committee of Canada recently presented a 1953 Design Award to The Enterprise Foundry Co. Limited, of Sackville, N. B., for their fully-automatic, oil-electric combination range shown on the left. This range, as well as a number of other ranges in the Enterprise line, incorporates a Perma-View Oven Door Window.





Here's what Mr. D. S. Fisher. of Enterprise Foundry, says:

"The Perma-View oven door window, which we are now using in a number of our ranges, is being welcomed by our customers, as it definitely adds to the sales appeal of the ranges in which it is incorporated.

"From a manufacturing standpoint, we welcome the simple installation and the fact that the unit is giving excellent performance."

PRODUCTS, INCORPORATED

16

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# Hings to Remember! for easier selling of Electric Ranges



All-over heat pattern at every setting means better surface cooking. Foods cook faster, more uniformly. Also much more simple to use, a big feature with women.



Larger confact area with cooking utensil (up to 34% more) means more efficient surface cooking. Because less current is needed, users save on electricity.



Single terminal connection permits unit to expand and contract without tension or warping. This means unit stays flat, maintains high efficiency for years.



"Swing-away" hinging means easier cleaning of the unit and pan. Note also that there are no cross-braces on the unit to collect and hold unsightly dirt.

### Sell "Simplified Cooking" with TK MONOTUBES®

It is no accident that more and more electric ranges are being equipped with TK Monotube Surface Units. Nor that for three straight years, ranges with single-coil cooking elements have outsold all other types combined.

There's a reason for this. Namely, that homemakers like the added features they get with Monotube Units. And alert dealers have been quick to capitalize on this competitive advantage. If you haven't yet done so, you have a pleasant surprise (and a lot of extra range business) ahead of you in '54.

Dealers also tell us that Monotubes, when promoted for replacement purposes, not only boost sales in this end of their businesses, but lead to many new-range sales. There may be a thought here for you. If you would care to learn more, just drop us a line!

FERRO

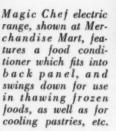
TUTTLE and KIFT, INC.

a Subsidiary of Ferro Corporation

1815 N. MONITOR AVE. . CHICAGO 39, ILLINOIS



At Furniture Mart, Hardwick's 75th anniversary model,





featuring new safety device, is shown to C. H. Horine, of Skelly Oil, by G. M. Rohde, a divisional sales manager.



R. M. Sawbridge, Tappan district manager, shows their new range with satinfinished chrome trim to Mrs. Eleanor Kraus, of Public Service Co. of No. Indiana. lines for its 15th anniversary year (see the Spotlight Page in January 1954 finish).

Some companies introduced halfand-half units, with the top half used as a refrigerator and the bottom as a freezer. Both Coolerator and Manitowoc featured separate exterior doors for both halves. Admiral showed their "up-side down" combination, with the freezer at the bottom, with a separate "interior" door.

Rhodes introduced an all-aluminum refrigerator-freezer, with the left half used as a freezer, and the right half as a refrigerator.

An "ambidextrous" refrigerator was announced by Philco. It opens to the left or right. A handle in the center of the two-way door unhinges it on the right or left-but not both at the same time.

#### More color in appliances

"Skilful use of color" was one of the features that won the 1954 gold



T. Ray Lukens, distributor, is shown with Rhodes all-aluminum combination refriger-

R. E. Grimsley, Gray & Dudley vice president, and Frank Raymond, of Keeler Brass, admire new gas range finished in canary yellow.

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Larry Wells, Crosley zone manager, and Mr. Stevens, a dealer, watch Mrs. Stevens use beverage tap in door of new Crosley refrigerator.

Joan Cassell demonstrates Cribben & Sexton's "perfect 36" range with double oven.



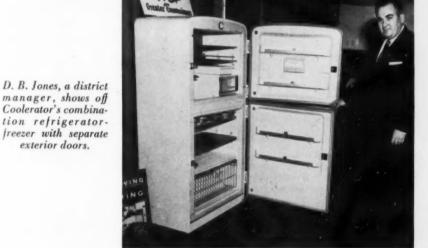
medal of the Fashion Academy for the Quicfrez line of refrigerators, according to Harry Ryan, Quicfrez vice president. The line is highlighted with touches of color chrome, gold and green on the crests, and chrome in the handle. The units also have touch-type door latches.

America's first copper-finished refrigerator was shown by Servel. The freezer compartment door of their "automatic ice-maker" refrigerator is plated with satin-brushed copper, and the scuff plate is finished to match the door.

The week following the winter market, *Frigidaire* unveiled its line of colored refrigerators and ranges (see Page 69).

Built-in cooking units in color, "contour-styled" to match the lines of their steel kitchens, were introduced by *Murray*. The surface cooking units and the built-in ovens are to Page 78→

More market photos . . . next page



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Leon Conner, sales rep., and Bill Biddle, chief engineer Athens Stove, show off their range "with a griddle in the middle and a shelf on top."



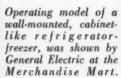
Built-in cooking units in color, contour-styled to match their steel kitchens, were shown at Merchandise Mart by Murray. Colors are yellow, green, blue and gray.



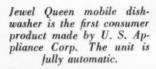




Mounted on an easy-rolling base, the Norge Time-Line automatic washer can be stored in any out-of-the-way corner, then rolled in place easily for washday use.



"Mrs. America" of 1954 with Curry W. Stoup, new vice president of Avco and gen. sales mgr. of American Kitchens Div., are shown in a "Mrs. America" kitchen.





Housewife can easily remove food package from adjustable food holders in Stor-Mor door of Amana freezer.



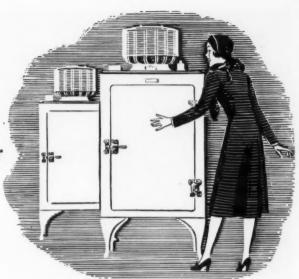
Admiral's new room air conditioner has a permanent, cleanable filter which removes dust, dirt, soot and pollen from the air before circulating it.



Double oven service in a single oven range is feature of Kelvinator electric range with a "bonus broiler". Broiler unit is removed from top of oven and placed in left hand storage compartment, making possible simultaneous baking and broiling.



The G-E refrigerator has come a long way since 1933



# ... and so has Du Pont DULUX enamel!

GENERAL ELECTRIC'S famous"monitor top" refrigerator delighted homemakers with its efficiency and good looks back in 1933. But finding new ways to make kitchens more beautiful, more pleasant to be in . . . new ways to give America's women more and more leisure .. has been among the basic aims of General Electric over the years. That's why today's General Electric refrigerator, with its new revolving shelves, is a marvel of streamlined efficiency and compactness that the 1933 housewife could not even dream of.

And so it is with America's leading home appliance finish-Du Pont DULUX Enamel. Constant research over the years by Du Pont chemists has resulted in a finish with rugged resistance to chipping, cracking, scratching and staining. Now DULUX is easier to clean ... keeps its glistening white beauty longer than ever before! That's why the DULUX of today meets the most exacting requirements of today's topflight appliance manufacturers. E. I. du Pont de Nemours & Co. (Inc.), Finishes Division, Wilmington 98, Delaware.



PETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

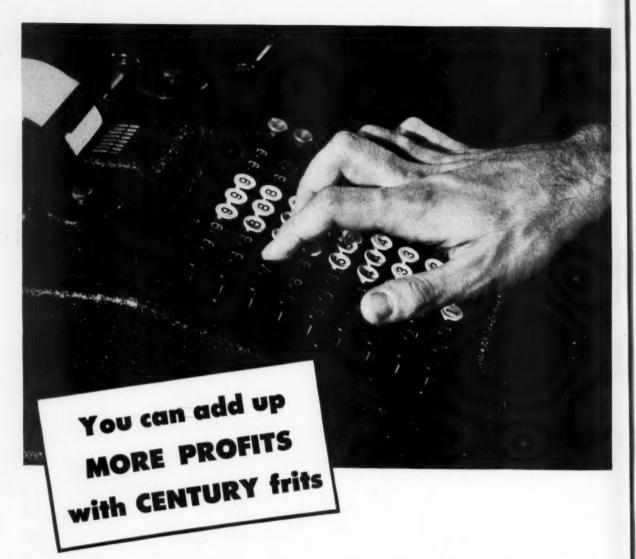


#### America's leading home appliance finish

. . . has helped sell over 36,000,000 refrigerators!

finish FEBRUARY . 1954

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**E**ACH year more and more porcelain enameling plants are learning how to make their dollar stretch when it comes to buying frit.

You stretch one way by saving on the original purchase price and you stretch another through more efficient plant operation.

You too can make these savings with Century time proved frits, frits that are tops for adding beauty and durability to your finished metal product.

If you haven't tried Century frit give us a ring right now — and stretch that dollar now!



### CENTURY VITREOUS ENAMEL COMPANY

6641-61 S. Narragansett Ave., Chicago 38, III.

# Adherence tests for porcelain enamels and high temperature ceramic coatings

Part II — application of standard PEI adherence test to high temperature coatings

by George Warren . THE PFAUDLER COMPANY, ROCHESTER, NEW YORK

IT IS pertinent that the adherence meter was developed for testing conventional porcelain enamels. Because of the thinness of application of some high temperature ceramic coatings and the unusual physical properties of these coatings, it cannot be properly assumed in advance that this test is necessarily suitable for high temperature ceramic coatings.

Some exploratory efforts were recently made to determine whether or not the PEI adherence testing equipment can be used to evaluate the adherence of these coatings. High temperature ceramic coatings A and B were applied to Inconel 0.043 in. thick as recommended for the industrial use of these coatings. Table II shows adherence indices determined after these specimens were deformed with die 18, the die specified in Table I (Part I) for this metal thickness, as well as deeper dies, 20, 24, and X. It will be noted that the adherence indices decrease as the die depth increases. One specimen of each enamel that was not previously deformed was placed in the furnace again. These were soaked at 1850°F. for four hours, and then deformed with die 20 and tested for adherence. The adherence index of coating A was found to be 99.4 (underscored value of Table II) which is higher than that obtained with normal firing. When visually examined, the coating appeared to be unchanged after this soaking treatment. The adherence index of coating B was found to be 30.3 as compared to 95.1 after normal firing. Herein lies a striking example of "apparent adherence." Whereas the normally fired coating B had a black, sintered look, the coating, after being fired 4 hours at 1850°F., appeared vitreous with a blue-green color. Undoubtedly the physical properties of the coating in these two conditions were quite different. Therefore, even if the absolute adherence had remained the same, the apparent adherence would not, and the behavior in service would not be the same. (Coating B was not intended for use at temperatures as high as 1850°F.) Consider the analogous condition of a onequarter inch layer of rubber and a one-quarter inch laver of wood glued to one-half inch thick steel plates with equal adhesive forces. It would be expected that when the two materials are significantly deflected in service, the wood-steel interface would fall before the rubber-steel interface. When coating B was normally fired, it deflected in a manner analogous to that of rubber on metal, then when it finally failed, the failure was one of incipient spalling. But, after being soaked at the higher temperature, the vitreous coating tended to pull away from the metal in larger pieces such as the wood would do.

Coating B was also fired on 0.052 in, enameling iron. In this case the recommended nickel flash was omitted in order that poor adherence would result. These were fired at four dif-

Table II

Adherence indices as determined for coatings A and B (on 0.043 in. Inconel) with different dies. All values were determined for normally fired specimens except the underscored values at die No. 20. These were obtained after the specimens had soaked at 1850°F, for four hours.

Die Number	(	Coating		
	A		В	
18	100.0		96.4	
20	95.1	99.4	95.1	30.3
24	92.1		94.0	
X	83.6		90.9	

Table III

Adherence indices as determined by die number 14 and 18 after coating B had been applied to 0.052 in. enameling iron and fired as indicated.

Firing Temperature	Die N	umber
	14	18
1500	15.6	1.8
1550	42.4	3.0
1600	31.1	13.3
1650	70.3	26.0

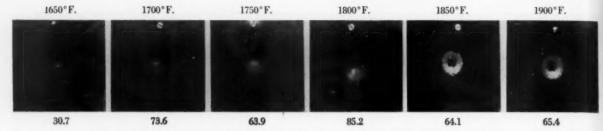


Figure 10—The effect of the firing temperature (for five minutes) on the adherence index of ceramic coating A. Recommended firing temperatures is 1800°F.

ferent temperatures as shown in Table III. The well recognized effect of firing temperature on adherence is clearly demonstrated by these results. It is also evident that when specimens were deformed by the die specified in Table I, low adherence indices were obtained; when deformed with a shallower die, higher indices were obtained as expected. This further illustrates the previously described effect of die depth and the versatility that the set of dies lends to testing with this method.

When coating A was tested after being fired at various temperatures, the behavior of the coating and the adherence indices obtained with the underfired specimens were somewhat different from those usually obtained with coating B or conventional porcelain enamels when underfired.

Figure 10 is a photograph of the specimens and results obtained when this coating was fired on 18-8 stainless steel at 50° intervals between 1650°F. and 1900°F. The recommended firing temperature is 1800°F. When fired at 1650°F. the coating was not sintered and could be readily scratched with the thumb nail. However, when tested for adherence, the index is 30.7. While this is unacceptably low even if the coating appeared satisfactory in other respects, it might be considered high enough to be misleading. When de-

formed, much of the coating peeled off like an organic paint, but enough of it deformed with the metal to prevent some of the probes of the meter from contacting metal. Specimens

#### Author's Note:

Since the work in this paper was carried out, it has been reported by other users of the PEI adherence testing equipment that more satisfactory results are obtained with coatings of the very thin type when the deformed specimens are soaked in water a short period of time before testing with the meter. This insures complete removal of coating fragments that may otherwise remain loosely attached to the surfaces.

fired at 1700°F. and 1750°F. spalled profusely while cooling to room temperature. The thin layer of coating remaining after cooling did not come off when the specimen was deformed; as a result the adherence values were fairly high (73.6 and 63.9). While these numerical values are considered anomalous, it is readily apparent from observation of the coating that it is not acceptable when fired at 1650 or 1750°F., and therefore little or no risk is involved under such circumstances. When fired at the recommended firing temperature and above, there was no indication that the numerical results were anomalous. Whereas after firing at 1800°F. the coating seemed friable when deformed, at 1850°F. and 1900°F. its failure indicated that the coating was stronger, causing it to fail over larger areas instead of spalling incipiently at points. As a consequence the apparent adherence was less at the higher temperatures.

Prof. R. M. King and associates, of The Ohio State University, cooperated with this paper as follows:

Coatings C and D were fired on type 302 stainless steel and 1010 mild steel. One-half of the specimens were tested for adherence after normal firing and the other one-half were thermal shocked by heating for fifteen-minute periods at 1400°F. and cooling for alternate fifteen-minute periods for a period of eight hours. After this treatment the specimens were soaked for 16 hours at 1400°F. Adherence indices determined for normally fired and thermal shocked specimens are shown in Table IV.

It is evident that the apparent adherence of these specimens was seriously affected by the thermal shock and furnace soaking treatment. This further points out a phase of the adherence problem to be reckoned with in testing and evaluating high temperature ceramic coating.

#### Conclusion

The results presented and discussed in this paper demonstrate that the PEI adherence test is a satisfactory method for resolving the apparent adherence of high temperature ceramic coatings as they exist today. Such evaluation should be particularly useful in vendor's compliance with customer's specifications as well as in the research, development, and control of these coatings.

Table IV

Type of Alloy Base	Normally Fired	Thermal Shocked and Furnace Soaked
C { 302 Stainless Steel	80.1 68.8	51.5 57.7
D { 302 Stainless Steel	90.3 71.5	32.2 8.8

## completely finished . .

#### **OPERATIONS**

- 1 Washing
- 2 Rinsing

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- 3 Hot Air Blowoff & Dry
- 4 Paint Spray
- 5 Paint Bake

ENGINEERED BY

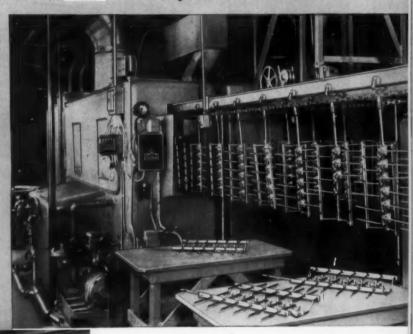
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Unusually compact, this CINCINNATI-engineered small parts finishing system has proved to be a major improvement in The George R. Carter Company's production facilities. Complete finishing operations on automobile trim hardware, parts are performed efficiently and quickly.

With a minimum of adaptation this Cincinnati system can handle a large variety of small parts. Representative installations have shown savings up to 75% in time and cost.

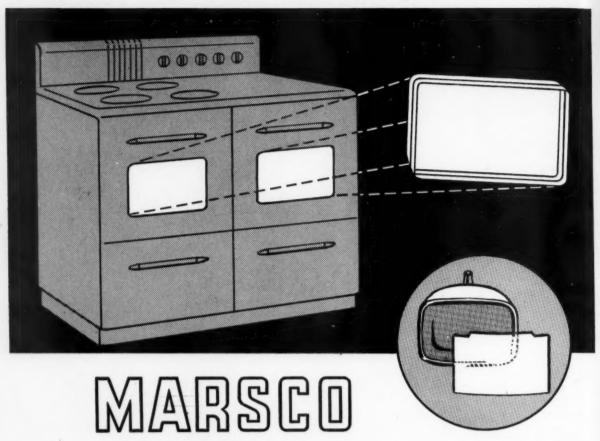


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# 1018 ANNIVERSARY 1954

#### **OHIO STATE UNIVERSITY**

To finish:

Congratulations upon reaching your 10th birthday. An age of ten implies childhood and approaching adolescence, but with *finish* one might well say that it has achieved adulthood.

I am sure that finish would not have reached its present stature and prestige without a lot of hard work, worry and ability being put into it, and you and your immediate staff should be given a full measure of praise and credit for your accomplishments.

I wish you many more years of added success to that which you have already achieved.

R. M. King Ceramic and Chemical Engineer

# NATIONAL PAINT, VARNISH and LACOUER ASSOCIATION

Dear Dana:

It gives me a great deal of pleasure to have this opportunity to congratulate *finish*, The Magazine of Appliance and Metal Products Manufacturing on its 10th Anniversary.

Industrial Product Finishes have made remarkable progress during the past ten years, the momentum of which is still increasing. This branch of our Industry is constantly devising new and improved specialized coatings for automobiles, furniture and household appliances, all designed to increase their beauty and serviceability to the consumer.

finish has played an important part in making this progress possible through wide dissemination of up-to-date information throughout the industrial finishing field. You may justifiably take pride in the satisfaction of a job well done.

As President of the National Paint, Varnish and Lacquer Association, I want especially to add my commendation for the fine cooperation you and your editorial staff have given to this organization and our Industry. It typifies the high standards established for finish and insures your continued success through the years to come.

With warm personal regards to you and to each of the editors of finish.

Joseph F. Battley President

#### **HUYCK CONSTRUCTION COMPANY**

To finish:

Congratulations on your 10th anniversary! You've done an excellent job in reaching this important milestone.

Having been an advertiser in your first issue, we derive some personal satisfaction from your progress since it justifies our confidence of 10 years ago. Just as we had confidence in you, so the porcelain enamel and heat treating industries have had confidence in us in masonry by "HUYCK." And *finish* has helped us build that confidence for through our advertising messages these past 10 years, we have been able to keep industry informed of our activities in furnace building, in mill lining and other types of industrial masonry.

Please accept our sincere good wishes for every measure of success in the years to come.

L. G. Huyck Owner

#### UNIVERSITY OF ILLINOIS

To finish:

It seems to me in looking back over ten years of progress in the Metal Products Manufacturing field that two things stand out. First, is the increasing diversity and adaptability of such products. As their field of usefulness expands they are to be found in many critical areas where they are called upon to withstand or to react properly with such things as electricity, heat, corrosive fluids, and applied stresses. This brings up the second point, the ingenious development of numerous inorganic and organic finishes, each one designed to enable the metal product to function at its best in some particular environment.

The magazine finish has consistently kept abreast of such progress and has frequently pointed out ways in which further advancement could be made. In this respect finish is rather unique. In its columns all metals and all coatings meet on common ground. If they can do the job intended, they are in.

Dwight G. Bennett Research Professor Ceramic Engineering

# Where will you get your future engineers?

engineering enrollment problem is critical—industry cannot afford to neglect it

#### a guest editorial

by A. J. Andrews . PROFESSOR AND HEAD OF THE DEPARTMENT OF CERAMIC ENGINEERING UNIVERSITY OF ILLINOIS, AND TECHNICAL CONSULTANT FOR FINISH

THE ceramic industry is urgently in need of more ceramic engineers and technologists, but the enrollments in the schools training these men are, in general, at a low point. The ceramic schools have conducted many programs within their means to increase enrollments but these have not been very effective. To be effective, any program must go on year after year, and not be just a shot in the arm. A continuation of the present decline in enrollments in the ceramic departments of the colleges may be interpreted by the college administrators as indications that the need for ceramic engineers and technologists is not important. The University of Toronto and the University of Saskatchewan have both already discontinued their departments. Low enrollments mean decreased budgets, smaller and poorer staffs and a general loss of prestige.

It is not feasible for the departments in the colleges to conduct a large enough national program to influence the population in general. It may, however, be possible for the American Ceramic Society, working with the National Institute of Ceramic Engineers and the Ceramic Educational Council, and with the cooperation of industry and the schools, to carry out a national program.

Since industry is vitally affected by this situation, it is desirable that it assist the schools in this problem which they alone cannot solve. Those not acquainted with the problem immediately say "get more publicity" and they usually recommend talks to the senior groups in high schools. The problem, however, is not that simple. In a high school of two hundred graduates a year, which is a large high school, there would probably be four to six men interested in attending college in all fields of engineering. Neither high school authorities nor the students want promotional talks to their senior classes by

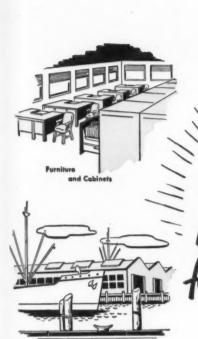
anyone. An educational talk is good, but from the standpoint of high schools, persons in every field of endeavor would like to present such material, as there is a shortage in all fields.

The solution of the problem is, therefore, a concentration on the few prospective engineers from each high school or a general national program aimed at our entire population. Only a large organization can undertake the latter, and extensive funds would be necessary.

A personal approach by men in industry offers one of considerable promise. If men from industry would contact their local high school principals, science teachers and personnel men, and make a special effort to see the students interested in engineering or science, they could concentrate on this group. It is suggested that this smaller group of high school students and their science teacher be invited to special inspection trips through the plant with a good guide who not only explains the operations, but also the function of the ceramic engineer.

An enthusiastic approach, making the plant trip a privilege rather than just an opportunity, would impress these young men. It might even be that the company would wish to establish a scholarship for one man each year from its local high school. The public relations established by such a program should be good for the company, the community, the students, and the development of more and better men for the industry.

finish is primarily concerned with only one segment of the ceramic industry—the segment represented by porcelain enamels and ceramic coatings for metal. We are happy to offer our associate editor this opportunity to stress a problem of importance to all segments of the industry.



Marine Applications and Many Other Uses

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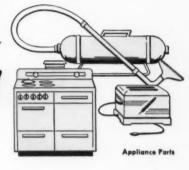
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#### Get all the advantages of aluminumin colors that help your product sell better

The remarkable properties of Du Pont vitreous enamel for aluminum permit a new, wider use of lightweight aluminum alloys. This outstanding protective finish enables you to take advantage of aluminum's desirable features in a variety of structural and decorative applications. And Du Pont vitreous enamel adds a wide color appeal to your household and industrial products—gives them another important sales advantage.

Vitreous enameled aluminum can be sheared, sawed, drilled and punched without damage to the coating. Costly prefabrication is eliminated because standard size enameled sheets can be cut to size on the job.

Almost unlimited range of colors and degrees of surface gloss available . . . can be produced in multi-color effects by masking, spray or screen stencil processes.

Du Pont vitreous enamel for aluminum is lightfast . . . displays excellent resistance to corrosion, abrasion, thermal shock, impact and flexing . . . has a high dielectric strength.

A standard thickness coating of vitreous enamel increases the rigidity of sheet aluminum as much as 60 %!

Vitreous enamel is readily applied by ordinary enameling and firing procedures.

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Please send me a free copy of your booklet on Du Pont Vitreous Enamel for Aluminum. I am interested in enameling the following types of work

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#### DESPITE REPEATED TUBBI

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#### KEEPS PORCELAIN SPARKLING

Daily splashing battles with Junior in the bathtub emphasize the importance of bright, easy-to-clean, porcelain enamel surfaces. Acid resistance for cast iron enamels, and opacity and other qualities of titania enamels for sheet steel are provided by titanium dioxide for today's sanitary ware.

Frit makers find that TITANOX-TG titanium dioxide does not sludge out during smelting and disperses completely for maximum solubility and maximum yield in the enamel. In addition, it flows easily in the dry state, does not stick or ball-up and does not require pre-milling or hammer milling in most cases when

dry blending with other ingredients of the batch.

TITANOX-TG, and TITANOX-TG-400 for blue-white titania enamels, have established standards and reduced rejection rates for the porcelain enamel industry. Consult today with our Technical Service Department on the advantages for you in TITANOX frit formulations. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; Atlanta 2; Boston 6; Chicago 3; Cleveland 15; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 9, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2: Toronto 1.

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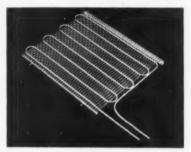


# New

# Supplies and Equipment

### B-10. Freezer evaporator shelves with steel serpentine tubing

New Designed primarily for upright type freezers, this new and improved shelf features steel serpentine tubing within an electro-



welded steel-wire structure for maximum exposure of coil surface plus greater protection of the coils. Tests indicate an unusually fast "pull down" and freezing action.

#### B-11. Portable all-weather hot spray finish heater

New Heavy asphaltum and mastic material may be sprayed smoothly, rapidly and virtually unaffected by cold weather, with this



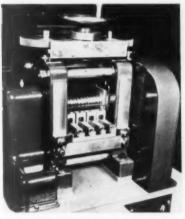
Powermastic heater. Weighing less than 40 lbs., the heater is placed in the material line about 25 feet back of the gun. Volumes up to 100 gal. per hour may be sprayed with effective results.

## B-12. Small rolling mills for tube reducing and sizing

New Accurate and rapid tube reducing and tube sizing on a low cost basis is possible with

#### More Information

For more information on new supplies, equipment and literature reviewed here, fill out the order form, or write to us on your company stationery.



small wire rolling mills. In photo, entry guides are shown on 3x5 wire mill which was modified for the manufacture of tubular heating units.

#### B-13. High-speed paint stripper

New A new liquid stripper is said to be the closest approach yet perfected to a "universal" paint stripper. The stripper can completely remove organic finishes from steel, magnesium, and zinc castings in one run-through, without harm to the metal surface. It involves no fire hazard, no odor or fumes, and is non-toxic.

#### B-14. Custom-made wire products for dish-washers, refrigerators

Wire products to specifications for many appliance applications are available in wire sizes up to ½ inch. Major applications for such products are for refrigerator grids and shelves, freezer baskets, dishwasher racks, etc. Available in finishes to specifications including zinc plate, organic and polyvinyl finishes.

#### B-15. Electric radiant element for industrial oven heating

New This new type of electric radiant heater, which emits rays in the far-infra-red field, has a

wide variety of uses such as baking, curing, drying, plasticizing and other heat processing where temperatures of 400-500° F. are required.

On applications such as heat treating, carburizing, etc., where higher temperatures are required, heaters with ratings up to 1600° F. can be supplied.

A single heating unit consists of a fused quartz tube, 48" long, in which is encased a heavy duty nickel-alloy heating element. The element is completely sealed and supported its full length inside a

rigid acid-proof quartz body, and cannot sag, warp or stretch and cause

to Page 64 ->





# Nu-Matic saves over \$300 monthly on finishing costs and downtime

PROBLEM: Finish faster . . . cut down-time . . . reduce abrasive costs.

THE ANSWER: Nu-Matic Air-Inflated Grinder. Built like a tubeless tire, it flattens out at point of contact . . . provides up to 3,000% greater abrasive contact area. Coated abrasive rides on a cushion of air . . . shapes to contour of work surface.

**RESULTS REPORTED:**\* Corners of refrigerator doors finished with a 75% savings in coated abrasive consumption—abrasive band changing time cut 80%.

Stainless steel sink welds reduced to a 4B finish in half the time required with a hard wheel — herringbone marks eliminated. Furnace casing tops finished twice as fast.

Flash removed from aluminum alloy forgings with a 50% saving in labor costs.

Holes in thin panels deburred in 35% less time. Weldments buffed and polished 50% faster.

#### **CUT YOUR COSTS -- AT OUR**

with a Nu-Matic Air-Inflated Grinder. Use it on your toughest jobs. Compare your costs before and after use. If Nu-Matic isn't worth \$15.00 a day — EVERY DAY — return it for full credit at no obligation. Specify Model 330 (3-1/2" dia. x 3" band width) or Model 535 (5" dia. x 3-1/2" band width).

\*Names on request

N-105

NU-MATIC GRINDERS, INC. 8224-A Carnegie Ave. Cleveland 3, Ohio



When Whirlpool Corporation switched from hand spray to the Ransburg No. 2 Process, paint mileage jumped approximately from 8 washer cabinets to TWENTY-TWO cabinets per gallon of paint. Whirlpool, too, was the first to employ the Ransburg "grouping" conveyor, especially suitable for use on washer or refrigerator lines.

Along with this spectacular paint saving, Whirlpool reports a more uniform, higher quality finish on their home laundry products. The number of repaint jobs was cut from 40% to less than 10%, and less than 1% of these are due to defective paint application.

Other economies are being achieved. The former 60-ft. water-washed, down-draft, hand spray booth was taken out, cutting maintenance, make-up air, and

heat loss substantially. Since there is no overspray paint to be exhausted with the No. 2 Process, ventilation is needed only for solvent vapor, and make-up air was reduced accordingly.

Appreciating the many advantages achieved on this cabinet line, Whirlpool put three more No. 2 Process Units to work, one on their dryer line . . . one on a miscellaneous parts line . . . and one on their wringer washer line in the Clyde, Ohio, plant.

The Whirlpool story is another typical example of greater efficiency, increased production—at less cost—with the Ransburg No. 2 Electrostatic Spray Process.

Write for our brochure describing the No. 2 Process in detail. Or, ask for our sound and color movie which shows numerous on-the-job examples of the No. 2 Process at work in plants all over the country.

Kansburg ELECTRO-COATING CORP.

Indianapolis 7, Indiana

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-> from Page 61

short circuiting. Each heating element has an individual stainless steel reflector in which it is firmly secured by a supporting and connection bracket at each end.

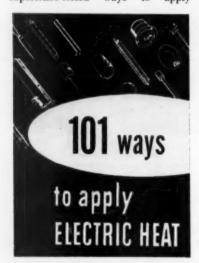
#### **New Industrial Literature**

201. Sound movie on "Making the Most of the Spray Painting Method"

New Spray painters and others interesting in spray painting will find a wealth of information in this 45-minute, black and white, sound 16 mm. film. The film is available for showings to qualified persons requesting it on their company letter-head.

202. Case histories on electric heat application in industry

New Illustrated case histories in this 32-page booklet show experience-tested ways to apply



metal-sheathed electric heating units in many different industrial jobs. A section is devoted to far-infra-red heating, showing 28 typical uses.

### 203. Catalog on refrigeration and air conditioning controls

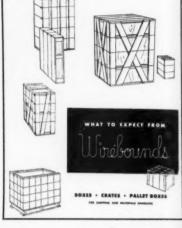
New Completely redesigned, the new condensed "Air Conditioning-Refrigeration Catalog" furnishes the latest information regarding dependable valves, filters and driers, plus product specifications, charts, and how-to-select information.

204. Color-sound movie tells story of use of hot lacquer in industry

New A new 20-minute, colorsound movie is available for telling the story of "industry's swing to hot lacquer". Plants of seven leading companies were visited and lacquer operations filmed on the spot.

205. Revised edition of brochure on use of wirebound boxes, pallets

New This revised edition on "What to Expect from Wirebounds" is profusely illustrated with actual case-history pictures of wirebound boxes, crates, and pallet



boxes in use. Brochure tells how wirebound boxes and crates can result in reduced tare weight, quicker packing, and easier stacking.

#### 206. Aluminum fabricating service

New A new 24-page booklet, "Catalog of Facilities," gives full details on facilities available for blanking, embossing, stamping, drawing, riveting, forming, roll shaping, welding, brazing, and finishing of aluminum.

## 207. Color and sound movie on electrostatic spray process

New A new sound and color movie presents numerous examples of electrostatic spraying of appliances and other products in various plants throughout the country.

#### 208. Catalog of nameplates

New This new catalog on quality nameplates should be of interest to manufacturers who need only a 100, or 100,000 nameplates.

### 209. Brochure on industrial piano-hinged apron conveyors

A line of piano-hinged apron conveyors in three pan-types, four chain pitches and four basic assemblies designed to meet a wide variety of conveyor applications, is contained in a new 2-color brochure. Stampings, castings, scrap and chips are among the materials for which the conveyors are expressly suited.

FINISH 360 N. Michigan Ave. Chicago 1, Illinois Please forward to me at once information on the new supplies and equipment and new industrial literature as enumerated below: No. \_ No.\_\_ No.\_\_\_\_ No.\_\_\_ No. No.\_\_\_\_ No.\_\_\_ \_\_\_\_\_ Title \_\_ Name \_ Company \_ Company Address Zone\_\_\_\_ State City \_



# Binks NEW AO-120 Oil and Water Extractor works where others fail

Binks new AO-120 Extractor assures more thorough removal of oil, water, rust, dirt, and other impurities from air used for spray finishing. Here are the features responsible for the higher air-cleaning efficiency:



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#### spiral baffle flings out impurities

When air enters the AO-120 Extractor, it strikes a metal baffle and immediately begins a fast spiral down the tube. As the air rotates, centrifugal force flings heavy particles of moisture, oil, rust and dirt out of the air stream. Impurities so removed drop to the bottom of the extractor for draining.



#### unique filter provides DOUBLE action

After leaving the baffles, the air makes a 180° turn and enters the filter. This special absorbent filter not only screens out foreign matter but also absorbs all moisture and fluids. The Binks filter is so effective that the AO-120 Extractor has proved suitable on lines where the amount of oil and water have been too great for other extractors.

Only Binks AO-120 Extractor combines both baffling and filtering in this way. Get full details today.

#### SEND for Bulletin AO-120

This bulletin tells why an extractor is imperative for fine finishes. Also how the AO-120 Extractor simplifies maintenance and saves time. No cost or obligation. Simply mail the coupon TODAY!



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Gentlemen: Please rush my FREE copy of your Bulletin AO-120 telling how your new extractor cuts finishing rejects, saves time and money in other ways, too. I understand there is no obligation of any kind.

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REPRESENTATIVES IN PRINCIPAL U. S. & CANADIAN CITIES . SEE YOUR CLASSIFIED DIRECTORY



#### The outlook in the gas appliance field

(Continued from Page 35)

#### A 21/2 billion dollar

#### expansion program

The gas industry is planning to spend approximately two and onehalf billion dollars before the end of 1956 for further expansion of the natural gas industry. In 1953 alone, more than 5,000 miles of pipeline were added to the existing gas pipeline network of almost 450,000 miles. This planned expansion, which does not include LP (bottled) Gas, is backed up by an ever-growing backlog of proved recoverable reserves of natural gas, now estimated at 200 trillion cubic feet. Thus, the opportunity to capitalize on new markets will continue.

The components for a successful year, which the foregoing briefly outlines, are all with us. This has been recognized by individual manufacturers, otherwise they would view their own position in the light of a general decline in both the gas appliance and equipment industry and in industry as a whole.

#### The outlook for electrical appliances

(Continued from Page 34)

freezers in sizes of 13 cubic feet or over. There is also some evidence that sales of larger models of electric ranges are increasing more rapidly

ernization, alterations, and repairs,

which are expected to increase in the

than the smaller or apartment sizes. Homeowners' programs for modcoming year, may well affect 1954 appliance sales. These programs are likely to include replacements or new installations of major appliances, thereby taking up some of the slack caused by any decreases in new home construction.

#### The appliance forecast

Consumer disposable income, family formations, and new home completions are all expected to drop off moderately this year. Accordingly, the industry expects that there will be a 3 to 5% decrease in total dollar sales of electrical appliances. Some individual lines of products are, however, expected to show substantial increases. These are the relatively new appliances, such as dehumidifiers, food waste disposers, dishwashers, room coolers, and television sets. Other items - such as electric fans. freezers, and washing machines expect to maintain their high 1953 levels of sales. A decrease of approximately 5% is expected in the case of such products as electric refrigerators, ranges, water heaters, and housewares.

#### Industrial apparatus

The volume of shipments of industrial apparatus — such as electric motors, industrial controls, and welding equipment - is expected to fall off 5% in 1954. This reflects the general expectations in the industrial field where it is estimated that industrial production will fall off 6% and industrial construction will be off

The year 1953 is generally being accepted by the business world as the peak year of post-war activity. This may or may not turn out to be true for the electrical manufacturing industry. In any event, in spite of the moderate decreases in business that have been described, the electrical manufacturing industry looks with confidence to 1954 as being one of its best years. The industry is, accordingly, planning to utilize all of its inherent abilities in the fields of technological development, production, distribution, and promotion to make certain that the business prospects for 1954 are realized or bettered.





USP engineers and manufactures the new wire and tube type evaporator freezing shelves in practically any size, shape, capacity

Condensers, too! Also of the wire and tube type, resistance welded construction, are providing refrigerator and freezer manufacturers with a new application versatility. USP condensers can be manufactured to match your needs and supplied in practically any finish.

> IF YOU HAVE SHELVING PROBLEM . . . why not consult our engineers. Their experience and services are yours for the asking.

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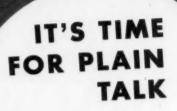
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About
ENAMELING
OXIDES

The trend to color is more in evidence every day. Home Decorating Editors are selling the home. In a color in the magazines she was a color in the magazines she was a color and Architectural following this obvious color demand by their customers must have an and years of color production and years of color production color get these essential answers at

Our Technical Staff and Samples are evailable to you without obligation. Let us help you with you with you with you with you with an allow or plants.

Sales representatives throughout The month

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Wast Coast Wantaria Library and CO. 100 to 1

# Frigidaire announces COLOR for refrigerators and ranges

pastel shades of green and yellow are offered on new 1954 appliances



NEW line of household refrigerators and electric ranges with exteriors finished in full color as well as in convenml white has been introduced by Frigidaire.

he new colored products are being mass-produced in two inclive pastel shades — Stratford yellow and Sherwood en. The colored refrigerators have matching interiors and white models also have new full-color styling inside.

lason M. Roberts, Frigidaire general manager and General lors vice president, announced the new line during a special view in the Waldorf-Astoria Hotel.

the explained there are three significant trends affecting the im of household refrigerators today:

1. We obviously are moving into a new era of colorful ing. Color-conscious Americans are buying bright autobiles and clothes, and there is a growing demand for more or in kitchens, dictated in part by modern home design.

2 Modern living has created a demand for refrigerators of er capacity. In answer, Frigidaire has included 13 and 15ic-foot food-freezer-refrigerator combinations in its new line.

 Finally, homemakers are demanding more and more food age convenience. . . . "

Frigidaire freezer-refrigerator is produced with cabiexterior in Sherwood green, Stratford yellow or white.





This homemaker "looks in" on her meal through a non-fogging window. Special built-in switch operates interior light.

In describing Frigidaire's use of color, Roberts said that Cycla-matic food freezer-refrigerator combinations are produced with colored cabinets in three sizes, including models with storage capacities of 8.4, 10.3 and 13 cubic feet. These new models with pastel cabinets are available with either synthetic enamel or porcelain finish.

Four porcelain-finished ranges, including three top Imperial models and a 30-inch range, have colored exteriors, which match the refrigerators.

Harley J. Earl, noted stylist and vice president in charge of GM Styling staff, explained that after a great deal of research and study, pastels were developed for the Frigidaire appliances which would harmonize with a wide variety of overall color schemes.

Another new product announced by Frigidaire is a 12.5-cubicfoot upright food freezer with a frozen food storage capacity of about 438 pounds. The cabinet styling matches the new refrigerators, and the interior is finished in full color.

See guest editorial "Home Appliances in Color" by Charlotte Eaton Conway, equipment and appliance editor, House Beautiful Magazine, in January 1954 finish.



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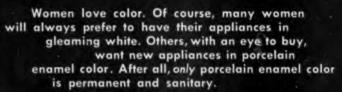


LOVE

WHITE,



BUT...



When adding color to your line, talk to Pemco about Neowite 500—an acid-resisting, titanium type frit with new color stability. It has extra-special workability.

PEMCO CORPORATION

Porcelain Enamel Frits for Steel, Iron and Aluminum • Oxides, Screening Pastes



BALTIMORE 24, MARYLAND

Glaze Frits and Grinding Wheel Frits 
Glaze Stains, Colors 
Vitrifiable Colors



# '53 ROOM AIR CONDITIONER SHIPMENTS TOP MILLION MARK

Shipments of room air conditioners for 1953 totalled about 1,075,000 units, compared with 365,451 units last year, or an increase of 194%, it was announced by Geo. S. Jones, Jr., managing director of the Air Conditioning and Refrigeration Institute.

Although room air-conditioners have been sold for over 20 years, it was stated that about 90% of all units have been sold in the last five years.

# EASTERN RAILS PLAN CUTS IN STEEL TARIFFS

Eastern railroads have agreed on rate reductions of from 18 per cent to 20 per cent on many iron and steel products and will file the new tariffs with the Interstate Commerce Commission on February 1 or shortly thereafter.

Edgar V. Hill, chairman of the Traffic Executive Association of the Eastern Railroads, said that the new rates are scheduled to go into effect 30 days after filing.

# WORCESTER PRESSED STEEL APPOINTMENTS

Carter C. Higgins, president and general manager of Worcester Pressed Steel Company, Worcester, Mass., has announced the appointments of Robert E. Byrne as chief engineer, and Charles T. Mooney as production superintendent.

#### COLEMAN NAMES ALBRIGHT WICHITA WORKS MANAGER

Douglas C. Albright is now associated with The Coleman Co., Inc.,



Wichita, Kansas, in the capacity of works manager. He will direct and coordinate all phases of industrial engineering, production engineering, manufacturing and quality control in the Wichita factories. The creation of the post of works manager and Albright's appointment follows a major postwar expansion program under which the company has greatly increased and diversified its manufacturing operations, stated Clarence Coleman, vice president and assistant general manager.

Before joining Coleman, Albright was for five years general manager of the Marysville Division of Ainsworth Mfg. Corp.

#### O'TOOLE NAMED GEN. SALES MGR. FOR GENERAL ELECTRIC

The appointment of John H. O'-Toole as general sales manager of General Electric Appliances Company has been announced by P. A. Tilley, president of GEA. His headquarters will be in Louisville.

# SET GOAL OF A MILLION OIL BURNERS IN 1954

The oil heat industry is setting its sights for the sale of a million domestic oil burners in 1954, and a total of 10,000,000 installations in 1960.

Encouraged by the continued high level of consumer demand for oil heat, and with the sale of approximately 800,000 domestic oil burners in 1953, the oil heat industry is looking forward to 1954 as the greatest year in its history, says the Plumbing and Heating Industries Bureau.

# STOCKHOLDERS OK PHILCO PURCHASE OF DEXTER

Philco Corporation has announced that the sales of the assets of The Dexter Company, Fairfield, Iowa, manufacturers of home laundry equipment, to Philco has been approved by Dexter stockholders. It is planned to complete the transaction by Feb. 10.

# BENDIX SELLS CLYDE PLANT TO WHIRLPOOL; TRANSFERS LAUNDRY PRODUCTION TO NASHVILLE

Victor Emanuel, president and chairman of Avco Manufacturing Corp., and Elisha Gray, president of Whirlpool Corporation, have announced jointly that Whirlpool has contracted to purchase Avco's Ben-

dix Home Appliances laundry manufacturing plant at Clyde, Ohio.

Bendix, it was announced, will transfer its laundry manufacturing operation to enlarged facilities at Avco's Nashville, Tenn., plant.

finish FEBRUARY . 1954

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# **PUSH-BUTTON HEAT**

CONTROLLED AND DIRECTED EXACTLY AS NEEDED FOR FINEST QUALITY BAKING



Pictured above is the Fostoria installation at the Studebaker aircraft plant in Chicago. Two 83 ft. ovent bake silicone aluminum paint on jet engine blades in one hour. After baking, a cool down chamber reduces the pieces to room temperature for bandling in 30 minutes.

# Profit with modern fostoria ovens

#### ALL THESE ADVANTAGES

Faster Cycles
Fastest heat transfer. Greatest output to input. Instant action.

Less Space
Most production for oven size.
May be ceiling mounted.

Clean Operation
No by-products of combustion.
No condensation.

Uniform Bake
Evenray heat distribution with
thorough penetration.

Flexibility
Adaptable to any material, any shape, any color. Infinitely variable heat levels.

Sufety Controlled
No warm-up, no shut-off lag.
Instant heat control.

Less Maintenance Lowest source replacement cost. Least efficiency loss.

Highest Efficiency Less than 2% energy loss. Heats product—not oven walls.

Cuts Costs
Lowest "per piece" production cost.
Competitive initial cost.

Reliability
Foremost engineering "know-how"
and service.

The miracle of America's industrial progress is based on engineering ingenuity in building and using faster and better production equipment. The equipment of yesterday is obsolete today. New methods, new efficiency are the keys to business growth and profit. This is why plants everywhere are modernizing their baking operations with Fostoria ovens. Now, thoroughly proved in over 7,000 plants, anything that can be baked, can be baked better and more efficiently in the modern Fostoria oven. Here, today, is "push-button" heat, automatically controlled, wide in versatility, low-cost in operation, by far the most efficient of all industrial ovens. For the benefit of your production progress, compare Fostoria advantages with your present baking operation. On any baking problem, request the expert on-the-job assistance available to you by Fostoria field engineers.



SEND FOR COMPLETE FACTS
Write for this brochure of
technical facts and case histories of many Fostoria oven
installations. Tell us your particular problem and we will
include data directly applicable

THE FOSTORIA PRESSED STEEL CORP.
FOSTORIA, OHIO, Dept. F
Please send information on ovens for

OSTOPIA OVENS

Name	
Company	
Street	
City	State

"The demand for Bendix automatic home laundry appliances has accelerated so rapidly," Emanuel said, "that we have completely outgrown in four years the former Bendix plant which is immediately adjacent to the Whirlpool factory at Clyde. Accordingly, we have decided to establish new and enlarged laundry manufacturing operations for Avco in our huge, modern plant at Nashville, where we can set up production lines that will take care of our needs for some years to come."

Gray declared: "Acquisition of the Bendix plant at Clyde permits us to coordinate more efficiently the multiple operations of manufacturing, warehousing, and distribution brought about by our expanded sales requirements. The purchase does not in any way involve the Bendix products."

It was said that Avco's move to Nashville and Whirlpool's utilization of the 265,000 square foot Avco plant at Clyde would be carried out gradually over a period of approximately six months.

Avco's plant at Nashville has 1,100,000 square feet of space under one roof. During World War II it was an important producer of military aircraft. In recent years it has been the manufacturing source of Avco's ranges and freezers and is producing aircraft sub-assemblies for the defense program. The plant has extensive modern porcelain enameling facilities.

# RAY LITTLE TO DIRECT GAMA SALES PROMOTION

Ray Little, for the past nine years general sales manager of the Equitable Gas Company, Pittsburgh, has joined the Gas Appliance Manufacturers Association as director of sales promotion.

In this new GAMA post, Little will direct the promotional activities of all of the product divisions of the association — domestic, commercial and industrial — and will coordinate tie-ins for the appliance manufacturers with the \$1,250,000 advertising and promotion program of the American Gas Association. His activities will concern all gas appliances and equipment — ranges, house heating

equipment, refrigerators, water heaters, space heaters, home incinerators, clothes dryers, as well as gas-fired equipment used in hotels, restaurants, institutions, commercial establishments and in more than 26,000 industrial heat processes.

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# NELSON NAMED PLANT MANAGER FOR ORLEY

George Orley, president of Orley Corporation, Detroit, has announced



the appointment of Arthur E. Nelson as plant manager. Nelson will have complete charge of plant operations, including the new finishing equipment and other new machinery recently installed.

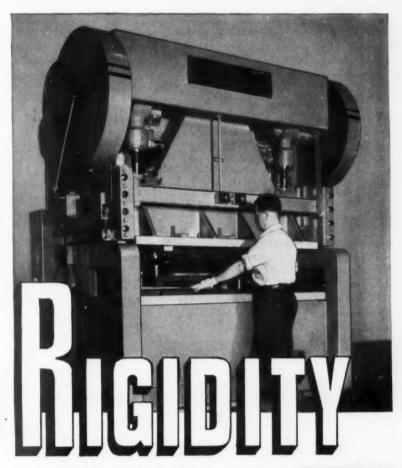
Nelson was formerly director of manufacturing for Ironrite, Inc.

# PERMUTIT TO EXPAND MANUFACTURING FACILITIES

The Permutit Company, makers of all types of industrial and commercial water conditioning equipment and ion exchange resins, is building a modern metal-working plant at Lancaster, Pa. "It is a move," said H. W. Foulds, president, "to expand and increase manufacturing facilities and to increase the sales potential of our varied products."

With the foundations in and most of the steel-work installed, it is scheduled for completion by the spring of 1954. The new manufacturing plant will cost about \$750,000 and will occupy 2 acres on a site of approximately 30 acres.

"The consolidation at Lancaster of two similar activities in plants at



# AND WIDE BED AREA MAKE THE **BATH**PRESS TYPE BRAKE IDEAL FOR BLANKING... PIERCING...SHALLOW DRAW

THE RIGIDITY of the Bath Press Type Brake is evidence of its high standard of construction. With speeds of 45 or 60 strokes per minute, it has many outstanding advantages such as Overload Protec-

tion, Pneumatic Clutch-Brake, End Feeding, Serial Operation etc. The one piece welded frame, with closed side housings, makes for perfect die alignment, which means stamping, bending etc. to very close measurements. Slide areas are large, about four times those in ordinary bending presses, adequate for most of the difficult blanking, stamping and punching operations. Ram and bed working areas are flush with the forward housing and easily reached by the operator.

Under a heavy production schedule the efficient and economical operation of the Bath Press Type Brake increases production and offsets losses incurred elsewhere.

For further information and specifications on the Bath Press Type Brakes write for this catalog.

# THE CYRIL BATTA COMPANY

MANUFACTURERS OF METAL FORMING MACHINERY 32306 AURORA ROAD . . . . SOLON, OHIO

(Located in the Greater Cleveland Area)

finish FEBRUARY . 1954

Brooklyn, N.Y. and Philadelphia, Pa., will effect substantial economies," stated Foulds, who added "Neither the main executive and sales office at New York, nor the manufacturing plant at Birmingham, N. J., will be affected by this expansion move. Our long-range plan provides for the full and continued use of the Birmingham property."

#### WESTINGHOUSE TO EXPAND MANSFIELD APPLIANCE PLANT

More than \$2,500,000 will be spent this year to rearrange and expand the electric appliance division plant of Westinghouse Electric Corp., in Mansfield, Ohio, as the first step in a program to approximately double production of several major appliances and substantially increase production of portable appliances, according to an announcement by J. H. Ashbaugh, vice president.

"Over two million dollars of the expenditure will be for new equipment," said Ashbaugh, "much of which will be used to replace machinery now being shipped to our new plant in Columbus, Ohio, which will eventually produce all Westinghouse refrigerators and freezers. Other new equipment, and some old equipment which will be shifted, will be placed in a new addition to the plant - a four-story structure providing an additional 34,000 square feet of working area."

Specifically, the greater portions of the new equipment being purchased for the Mansfield plant will be for the expansion of the following operations: (1) increased production of Corox heating units for major and portable appliances, (2) an additional paint oven, (3) expanded thermostat facilities, (4) additional mechanical presses, and (5) expanded fabricating facilities for major appliances.

#### **HURT JOINS DIXIE PRODUCTS** AS DIRECTOR OF RESEARCH

Robert B. Hurt, formerly associated with Hardwick Stove Co. for 37 years, has been appointed director of research for Dixie Products, Inc., of Cleveland, Tenn., according to S. B. Rymer, Jr., president.

Rymer also announced the establishment of a research division to conduct more fundamental research in gas cooking appliances to better serve its customers in the gas range industry.

#### THOR CULMINATES "MILLION DOLLAR" SALES CONTEST

More than 70 distributor salesmen were guests of Thor Corporation, Chicago, in mid-December to celebrate the culmination of Thor's "Million Dollar Prize Bowl" sales contest.

Salesmen in each distributorship who pushed their sales quota to the highest point over quota were brought to Chicago for a three-day holiday for which the grand finale was a banquet at which "Miss Thor" was named, and the salesmen were awarded a variety of prizes.

In welcoming the salesmen to Chi-

cago, Thomas R. Chadwick, general sales manager, told them they had proved that "The slow major appliance market can be overcome by a return to hard selling." He pointed out that Thor distributors attained 107% of quota nationally during the two-month contest, and that 83% of the distributor organizations met or bettered their quota.



Above: Thomas R. Chadwick, Thor general sales manager, presenting a bouquet to Tudy Golden, who was named "Miss Thor."

Left: Thor salesmen were taken on a tour of Thor's home laundry manufacturing plant in Chicago.

# A Motor for LOW SPEED OPERATION



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If you are now manufacturing a product or developing a product where you need motion at slow speed, here is the motor for you. Hundreds of thousands now in use on cooking appliances, vending, coin operated, amusement, and advertising displays.

These AC gear motors are precision built and are being manufactured in volume for immediate delivery. For further information, send the requirements of your application to us. Special motors are built to meet your new product needs. Write today for data sheet.

OTORESEARCH COMPANY

1600 JUNCTION AVENUE
RACINE, WISCONSIN

Designers and Manufacturers of
SPECIAL INDUCTION MOTORS

# Specify MEYERCORD DECAL Transfers



—for difficulf highly-specialized applications

—for long day-after-day production runs—



### Meyercord Laboratory and Production Experience - PLUS Unexcelled Service - to Serve You Better!

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Sometimes we are too prone to tell our friends about the spectacular achievements of Meyercord in solving those "impossible" decal transfer applications . . like the new E-51 aircraft decals that resist up to 900 degree temperatures of jet engines, as well as the ravages of strong solvents and aircraft fuels. Specialized decal applications are a mighty important part of our business . . . but we're still first and foremost in the business of supplying standard Meyercord nameplate and identification decals. Whether you make type-writers, appliances, electrical

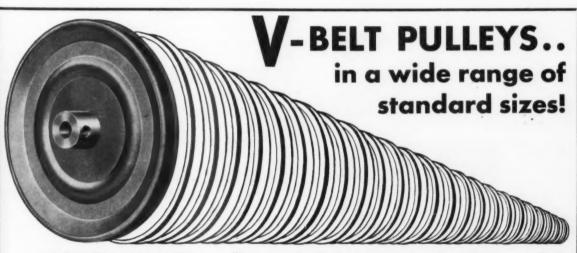
conduit...any product that is turned out on long-time production runs, be sure to investigate the advantages of Meyercord decal transfer uniformity, fine quality and absolutely unbeatable service on your production line.

#### Send for This Manual of MEYERCORD DECAL NAMEPLATES

Shows hundreds of uses for durable, washable decal nameplates . . . as trademarks, instruction charts or diagrams—in any size, colors, or design. This manual is FREE ...request it on your business letterhead, please.

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### NAGEL-CHASE

CASTERS for YOUR MOBILE
APPLIANCES ARE AVAILABLE
IN SIZES AND STYLES
TO SUIT YOUR NEEDS!

When you need pulleys for your automatic washers or dryers, consult Nagel-Chase. With a wide range of sizes available, ranging from 2-5/16" O.D. to 12" O.D., the probabilities are that just the size you need is available. Of course, if your quantities required are large enough to warrant it, these specialists in V-Belt pulley manufacture can produce any size you need.

Nagel-Chase pulleys are precision-built of welded pressed-steel with solid steel hub . . . light-weight and designed for long, trouble-free service.

Whatever your requirements in pulleys or casters, consult Nagel-Chase first.

THE NAGEL · CHASE

MANUFACTURING COMPANY
2811 N. Ashland Avenue, Chicago 13, Illi.

SPECIALISTS IN CASTERS AND PULLEYS FOR NEARLY A QUARTER CENTURY!

finish FEBRUARY . 1951

#### GAS WATER HEATER SHIPMENTS TOP '52 BY 17.8 PER CENT

Shipments of automatic gas water heaters continued to climb during October, exceeding shipments for the same month of the previous year for the seventeenth consecutive month, according to the Gas Appliance Manufacturers Association.

The October total was 196,500 units, according to Edward R. Martin, GAMA's director of marketing and statistics, a six per cent increase over the 185,300 units shipped during October of 1952.

Total water heater shipments during the first ten months amounted to 1,843,300, as compared with 1,564,-

700 during last year's comparable period, a 17.8 per cent gain.

Martin's estimates are based on a telegraphic survey conducted among members of GAMA's water heater division and expanded to represent the entire industry.

#### WESTINGHOUSE ANNOUNCES KEY PROMOTIONS IN APPLIANCE DIV.

Westinghouse Electric Corp. has announced that the electric appliance division has been divided into three separate product operations: major appliances, headed by R. J. Sargent, manager; portable appliances, R. M. Oliver, manager; and refrigeration specialties, H. F. Hildreth, manager.

While the present factory and office area of about 500,000 square feet will not be increased, the cubic footage will be more than doubled. The home laundry factory will be completely equipped with the latest machines and methods for efficient mass production. Overhead conveyors and other modern methods of moving components and sub-assemblies will be adapted to home laundry appliance manufacturing.

Sharp said the reason behind the advanced modernization of the home laundry factory is the necessity for achieving new production efficiencies and reduction of manufacturing costs in preparation for the most highly competitive period facing the appliance industry.

Since 1947, Hotpoint has made sizeable investments in new factories and improvements in Chicago and neighboring suburbs, one of the largest expansion programs in the appliance industry. The latest move follows closely the formal opening of Hotpoint's new refrigerator plant.

#### **HOTPOINT TO DOUBLE LAUNDRY PRODUCTION CAPACITY**

Hotpoint Company will immediately begin a comprehensive modernization program designed to more than double its present capacity for production of automatic clothes washers and automatic electric clothes dryers,

John C. Sharp, president, announced.

The company will modernize and enlarge its present Chicago factory, which was built in 1918. The new building is scheduled for completion late in 1954.



#### FRIGIDAIRE UNVEILS "DREAM KITCHEN"

A presstime report tells of the creation of an experimental "Kitchen of Tomorrow" by the Frigidaire Division of General Motors. Harley J. Earl, GM vice president in charge of styling, indicated that the "dream kitchen" actually was built to serve as a practical testing laboratory of both mechanical and styling ideas.

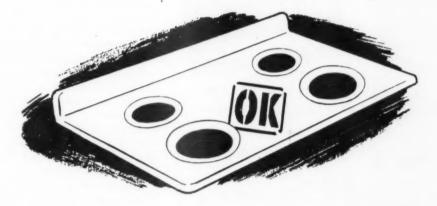
Here are a few of the kitchen's many features: electronic ovens, single-faucet sink, refrigerators and freezers with space-saving insulating, and wall cabinets which glide down within easy reach.

# PORCELAIN ENAMEL INSTITUTE NAMES COMMITTEE CHAIRMEN FOR 1954

John C. Oliver, secretary, Porcelain Enamel Institute, has announced the appointment of eleven committee chairmen for 1954 as follows: Annual Meeting, Herbert Turk, Pemco Corp.; Commercial Research, F. C. Woleslagle, U. S. Steel Corp.; Curtain Wall, C. D. Clawson, Ferro Corp.; Finance, R. A. Dadisman, Armco Steel Corp.; Institute Development, M. D. O'Leary, Chicago Vitreous Enamel Product Co.; Market Development, D. H. Malcom, Armco Steel Corp.; New Uses, J. F. Janecke, Ferro Corp.; Process Development, J. L. McLaughlin, finish; Quality Development, G. H. Spencer-Strong, Pemco Corp.; Shop Practices Forum, W. H. Pfeiffer, Frigidaire Division, General Motors Corp.; National Safe Transit, R. F. Bisbee, Westinghouse Electric Corp.



# D - E N A M E L I N G transforms "SECONDS" into "FIRSTS"



Reject or O.K.? These few words tell the story of D-Enameling. Ranges, bath tubs, sinks and washing machine tubs that once had to be rejected because of some defect in the porcelain enamel coating were either classed as "seconds", or scrapped as complete loss. But that was before D-Enameling. The story is different now. Scrap loss is at a minimum. Parts that

once had to be sold as "seconds" can now be successfully D-Enameled and re-enameled into perfect condition for first line use. If you'll send us 3 or 4 defective parts, we'll process them for you at our expense. You'll see for yourself why D-Enameling is now a permanent part of the appliance manufacturing picture.

# New Process D-Enameling Corp.

Highland and New Haven Avenues . Aurora, Illinois

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#### **CAMEO EXPANDS, ADDS DIRECTORS**

To bolster its expansion program, which already includes \$80,000 worth of new equipment and plant facilities, an authorization for a \$50,000 plant addition, J. T. Penton, president of California Metal Enameling Co., Los Angeles, has announced the appointment of four new directors.

They are Daniel P. O'Keefe, president of O'Keefe and Merritt Co.; K. L. Carver, retired vice pres. of Bank of America; D. H. Grady, corporation counsel; and Raymond W. McKee, secretary-treasurer of Maywood Glass Co.

#### **EKCO ACQUIRES AUTOYRE**

Ekco Products Co., Chicago manufacturer of housewares, has acquired Autoyre Co., Oakville, Conn., manufacturer of stamped bathroom and kitchen fittings.

It was announced that Philip B. Shailer will continue as president of Autoyre, which will operate independently as a wholly-owned Ekco subsidiary.

# EUREKA-WILLIAMS SOLD TO HENNEY MOTOR

Sales of the assets of Eureka-Williams Corp., Bloomington, Ill., to Henney Motor Co., Freeport, Ill., has been approved by stockholders. Arrangements were consummated by Russell Feldmann, principal Henney stockholder.

Eureka-Williams employs about 1200 persons, and manufactures oil burners, furnaces, vacuum cleaners, and garbage disposal units. It was stated that for the present the company would continue operation under Henry Burritt, present president.

#### Winter market . . .

-> from Page 49

available in stainless steel or in colored porcelain enamel. Colors are white, golden west yellow, ranch green, horizon blue, and mist gray.

Colored ranges were introduced by Gray & Dudley. They had very good reception from buyers, according to R. E. Grimsley, vice president and general manager. Their color ranges are available in Capri blue, canary yellow, surf green and sunrise pink.

Dortch, which introduced "fashioncolored" ranges at the summer market, displayed models in bright red, mint green, and yellow.

A number of home laundry equipment manufacturers displayed conventional washers with skirts in color. More refrigerator and home freezer manufacturers were turning to the use of color on the interior of their products.

#### New range innovations

An electronic unit on which foods can be warmed, boiled or fried without fear of burning or scorching, highlighted the new line of Westinghouse electric ranges. The unit measures the temperature of the food as it cooks, and, working much like an oven temperature control, maintains the selected temperature automatically by turning the current off and on as needed.





From Blueprint to Shipping Carton With a battery of presses ranging in size from onefourth to five hundred tons, New Monarch has the right press, tooling facilities and capacity for almost every kind or size of stamping.

But that's not all! With our three modern and highly efficient plants, we are also equipped—and staffed—to supply you with complete or sub-assemblies, finishing and packing. Whether it be for a single stamping or a complete from-blueprint-to-shipping contact in the set New Monesch for

shipping-carton job, ask New Monarch for an estimate on your work. No obligation.



NEW MONARCH MACHINE & STAMPING COMPANY

On their 75th anniversary, Hard-wick introduced a new safety feature on their line of gas ranges. This safety device prevents the escape of gas from burners, oven or pilot "even if the pilot is out and the dials are left at 'on' position for hours or days."

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Monarch announced a new roaster range with a "stoopless oven". In this range, a cover, located on the topside, is lifted so that the housewife can conveniently baste such dishes as fowl, ham, or game.

One of Magic Chef's electric range models features a "food conditioner" which fits into the back control panel, and swings down for use in thawing frozen foods, as well as for cooling cooked foods. Some of their gas range models feature a "magicaire" deodorizing lamp, as well as a "magic oven-eye"—a little red light in the back panel that glows when the oven is up to temperature.

Kelvinator launched its 40th anniversary year with a series of sweeping changes in key product lines. Their electric range line, for instance, features a transferable broiler unit in one model which makes it possible to broil and bake simultaneously in a single-oven range. For use, the broil-unit is simply moved from its right-hand oven position, and fitted into a special outlet in the left hand storage compartment. Another range feature is a removable oven bottom.

On the West Coast, O'Keefe & Merritt was reported to be prepared for unveiling a gas range with a Hi-Vue window utilizing the periscope principle so that the homemaker can check her baking at a glance.

#### Push-button air conditioning

Fresh'nd-Aire displayed a new room air conditioner with push-button "Electromagnetic" a u t o m a t i c weather controls which enable a person to instantly control both the room temperature and air circulation merely by touching a button.

On the Deepfreeze unit, indoor weather is dialed by concealed temperature controls. It is also equipped for separately controlled fresh air intake and stale air removal, in addi-

to Page 96 →



A functional guard and an attractive accent of stainless are combined in this stove handle escutcheon. At first glance this moulding appears to be a complicated stamping, requiring expensive tooling. Actually, it is a rolled shape—more economically produced, and fitted perfectly to highlight the graceful contour of the stove front.

Here again Pyramid's design engineers answered the needs of a customer† by producing to meet exacting design requirements at lowest possible cost. Stock mouldings are also available that will add sales appeal to many products. Our staff and 25 years of metal moulding experience are at your service. Call or write today.

†Name on request

# Pyramid Mouldings Inc.

5365 West Armstrong Ave., Chicago 30, Ill. New York California

# SEND FOR YOUR FREE COPY OF "PLAN BOOK OF METAL MOULDINGS"

No one connected with the design or manufacture of any appliance should be without a copy of this book containing hundreds of standard and special mouldings. Send for your free copy today.

Name	Title
Firm	

#### **NEWS ABOUT SUPPLIERS**



Delivery by air — is an added new step in the customer service of The Fahralloy Company, Harvey, Ill., manufacturers of heat resisting alloy castings. Robert E. Kroc, sales manager, stated that the plane, piloted by Ted Fahrenwald, a son of the company's founder, has been pressed into service on several occasions when necessity demanded unusually quick delivery. Shown above are Fahrenwald and Kroc.

#### WEAVER AWARDS AND FERRO SERVICE PINS PRESENTED

The annual Bob Weaver Award of Ferro Corp. and subsidiaries were presented at a recent dinner to four of Ferro's personnel by R. A. Weaver, chairman, for whom the award is named.

Award winners are R. W. Frank, safety director, Cleveland, for contributing to Ferro's safety record; R. A. Whiteman, chief process engineer, Tuttle & Kift, Inc., Chicago, for

reducing scrap and re-work; B. A. McDermott, Ferro plant manager, Nashville, for his reorganization of Ferro Powdered Metals, Inc.; and E. J. Riley, foreman, Ferro Chemical Corp., Bedford, Ohio, for raising production and quality standards.

Ferro service pins were also presented to six employees. Recipients of the service pins at the dinner, representing all the eligible employees who received theirs later, were H. T. Marks, admin. vice pres., 20 yrs; Dr. J. T. Robson, vice pres. allied engr.

div., 20 yrs; G. A. Hutt, vice pres. market research, 20 yrs; W. N. Noble, mgr. of operations, 20 yrs; Don R. Goetchius, asst. mgr. ceramic sales, 15 yrs; and T. F. Moeller, mgr. resale division, 10 yrs.

#### ROBERTS HEADS ALLOY SALES FOR REPUBLIC STEEL

Appointment of Clyde E. Roberts as manager of sales for the alloy steel division of Republic Steel Corp. has been announced by Norman W. Foy, vice president in charge of sales.

Roberts moves up from assistant manager to manager of one of Republic's largest and most important sales divisions. He will be in charge of all sales of alloy, stainless steel and titanium products. He succeeds Martin H. Schmid, who retired after 44 years service with Republic and predecessor companies.

# REYNOLDS METALS NAMES CALIFORNIA DISTRIBUTOR

Appointment of Turner Metal Supply Co., Huntington Park, Calif., as a distributor for aluminum wire, rod and bar products has been announced by Reynolds Metals Co. from its general sales office in Louisville.

# A-P CONTROLS FRANCHISES JOBBERS AS SERVICE STATIONS

Jobbers of heating appliance repair parts and accessories are being franchised by A-P Controls Corp. to offer repair service as a result of a factory training program. Repair men attend a three-day school held at the A-P Milwaukee plant.

Ferro's Bob Weaver Award was presented by Mr. Weaver (left) to R. A. Whiteman, B. A. McDermott, E. J. Riley, and R. W. Frank.



A-P factory group watches B. Kahrhoff, service shager, demonstrate procedure to use in instruction



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BILL GAINES



FRANK POST



D. L. MILES



A. E. MAC NALL

#### DETREX "ULTRASONICS" APPTS.

Appointment of Kermit D. Collom and Stanley E. Jacke to the staff of the new ultrasonics division of Detrex Corporation, Detroit, was announced by William F. Newbery, director of sales.

Collom will be in charge of sales, installation, and servicing of the new Detrex Soniclean machines which apply ultrasonic energy to precision metal cleaning. Jacke's duties will be devoted entirely to applied research in the ultrasonics field.

# PARKER NAMED SOUTHERN REP. BY DETROIT BRASS

Fred L. Parker, for more than twenty years associated with the stove manufacturing and distribution industry, has been appointed southern district sales representative of Detroit Brass & Malleable Co., with headquarters in Nashville. Parker will supervise the Alabama, Georgia and Tennessee area for the company.

#### GAINES TO WALES-STRIPPIT

Bill L. Gaines has been appointed sales engineer for the south central division of Wales-Strippit Corp., and will operate out of St. Louis division headquarters, handling most of Indiana, Illinois, Missouri and Kansas.

Prior to joining the Wales-Strippit Corporation, Gaines was employed as a tool engineer by International Harvester Co. He is current chairman of the editorial and public relations committee of the American Society of Tool Engineers, Evansville chapter.

# INDUSTRIAL FILTER NAMES REPS. IN 3 NEW BRANCH OFFICES

Industrial Filter & Pump Mfg. Co., Chicago, announced the following factory district representatives in sales and service engineering: George J. Dawson covering Pennsylvania and western New York from new branch offices in Pittsburgh and Philadelphia; Gil Valentine, covering the state of Michigan from the new Detroit branch office; and James Filkins will cover the states of Texas and Oklahoma from the new Dallas branch office.

#### **NEW ACP DETROIT OFFICE**

American Chemical Paint Co.'s Detroit office has moved to 10225 West. McNichols Road. D. L. Miles, manager of the mid-west territory, is supported by a staff of technical salesservice representatives.

#### STEELWELD OPENS DETROIT OFFICE

A new direct factory office has been opened in Detroit by The Cleveland Crane & Engineering Co., of Wickliffe, Ohio, for the sale and service of Steelweld metal-forming presses and shears throughout the state of Michigan. The office will be headed by Ralph K. Ford.

#### PENNSALT APPOINTS STODDARD

W. J. Stoddard has been named district supervisor in the Michigan district for the metal processing department of Pennsylvania Salt Mfg. Co., it was announced by J. J. Duffy, Jr., sales manager. Stoddard will supervise sales and service activities in the Michigan area for Pennsalt metal cleaners, Fosbond phosphate coatings and Fos Process lubricants for cold working.

#### **HEADS TINNERMAN DETROIT STAFF**

Appointment of Arthur E. MacNall as Detroit district sales manager for Tinnerman Products, Inc., was announced by Laurence H. Flora, director of sales.

# ROBERTSHAW-FULTON ADVANCES FRANK POST

Robertshaw-Fulton Controls Co. has announced the appointment of Frank H. Post as sales manager in charge of all sales for the Robertshaw-Fulton Thermostat Division and the American Thermometer Division. Post formerly was sales manager for domestic controls for the two divisions.

#### ACME STEEL NAMES RUSSERT

George P. Howell, Wisconsin district sales manager for strip steel division of Acme Steel Co. has announced the appointment of Arthur E. Russert as district sales representative for strip steel, with offices in Milwaukee.

ARTHUR RUSSERT



GIL VALENTINE



GEORGE DAWSON



JAMES FILKINS



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#### Hot spray lacquering of naval aircraft

(Continued from Page 31)

and the lacquer topcoats adhere better to it than to the synthetic primer, particularly if heavy lacquer coats are used. The surface is now ready to receive the hot spray coat of Specification MIL-L-7178 cellulose nitrate lacquer.

#### STEP IV - LACQUERING

An approved formula for the glossy sea blue lacquer used on military aircraft is included in Table IV. Equipment which can be used successfully in hot spraying military aircraft is described below. It should be understood that the equipment described does not represent an endorsement by the Navy Department of only these pieces of apparatus. Equivalent apparatus made by other manufacturers may prove every bit as satisfactory.

> \*M.B.C. Gun No. FX-1 Needle No. FX-1 Tip No. 765 Cap

\*Model LA-2 Heating Unit

\*High Velocity Pump No. AD-55A-6 or AD-30A-6 Paint Pump Unit for maintaining uniformly mixed paint.

\*(Contact finish for equipment sources)

Other pertinent information follows:

Approximately 3 volumes of Specification MIL-L-7178 lacquer is reduced with 1 volume of Specification MIL-T-6095 thinner (see Table V for the formula) to give the desired viscosity for spraying, which is 26 seconds with a No. 4 Ford cup.

Paint Pressure - 15 lbs./in.2 - rigidly controlled Steam Pressure 8 lbs./in.2 - rigid-Steam Pressure — 8 lbs./in.² — rigidly controlled
Air Pressure — 50 lbs./in.² — rigidly controlled and as dry as possible.
Paint Temperature (free flowing) at gun — 162°F. ± 2°F.
Paint Temperature (spray) — 4" from gun — 92 · 94°F.
Viscosity of Heated Paint — 18 to 20 seconds — No. 4 Ford Cup
Coating Thickness of Lacquer — 1 to 1½ mils (dry) achieved by one cross coat.

The LA-2 heater is a small cylindrical heat exchanger approximately eight inches long and weighs approximately a pound and a half. It fits in the fluid line about three feet in back of the spray gun.

The capacity of the unit is approxi-

cross coat.

mately 1.6 pints of lacquer per minute, and the operator is ready to start spraying within a minute or so after the heating medium is turned on. Figure 1 is a schematic of the equipment.

The unit is held in the operator's left hand while he sprays with his right. Asbestos insulation is on the heater. Since the unit is light, and the heater can be used with any length of hose at any distance from the pressure tank, the operator has complete mobility to climb over aircraft and work around these large irregular objects. It is to be noted that since the unit is in a fixed position close to the gun, there is no heat loss, regardless of the length of hose.

It should also be understood that the favorable results obtained in the laboratories of the Naval Air Experimental Station and in the Naval air repair bases, with the hot spray application of aircraft lacquer, cannot be considered at this time as an endorsement by the Navy Department that this process may now be used for lacquering military aircraft. The final decision is being held in abeyance pending service experience of those aircraft which were painted in this manner. However, it is the opinion of the author that service experience will find no appreciable differences in lacquer films applied either hot or by the cold spray processes.

This is based on the fact that there were no differences in laboratory tests. With paint systems following the four steps described in this article, comprehensive testing showed no differences in film properties regardless of whether the lacquers were applied cold in two coats or hot in one coat at the same film thickness. Adhesion measurements, resistance to a variety of conditions such as abrasion, water, oil and gasoline immersion, gloss, etc., showed equivalent film performance. This was also true of panel systems which were exposed on land and tidewater racks in Florida for a period of one year. Therefore, it is believed that hot spraying of lacquer films is here to stay.

Acknowledgement: The author wishes acknowledge the efforts of Mr. Alfred M. Malloy, Bureau of Aeronautics, Department of the Navy, Washington 25, D.C., Mr. Walter Morris, Naval Air Station, Jacksonville, Florida, and Mrs. Mary Pellegrini of the Aeronautical Materials Laboratory in the development of the hot spray technique for the lacquering of naval aircraft.

